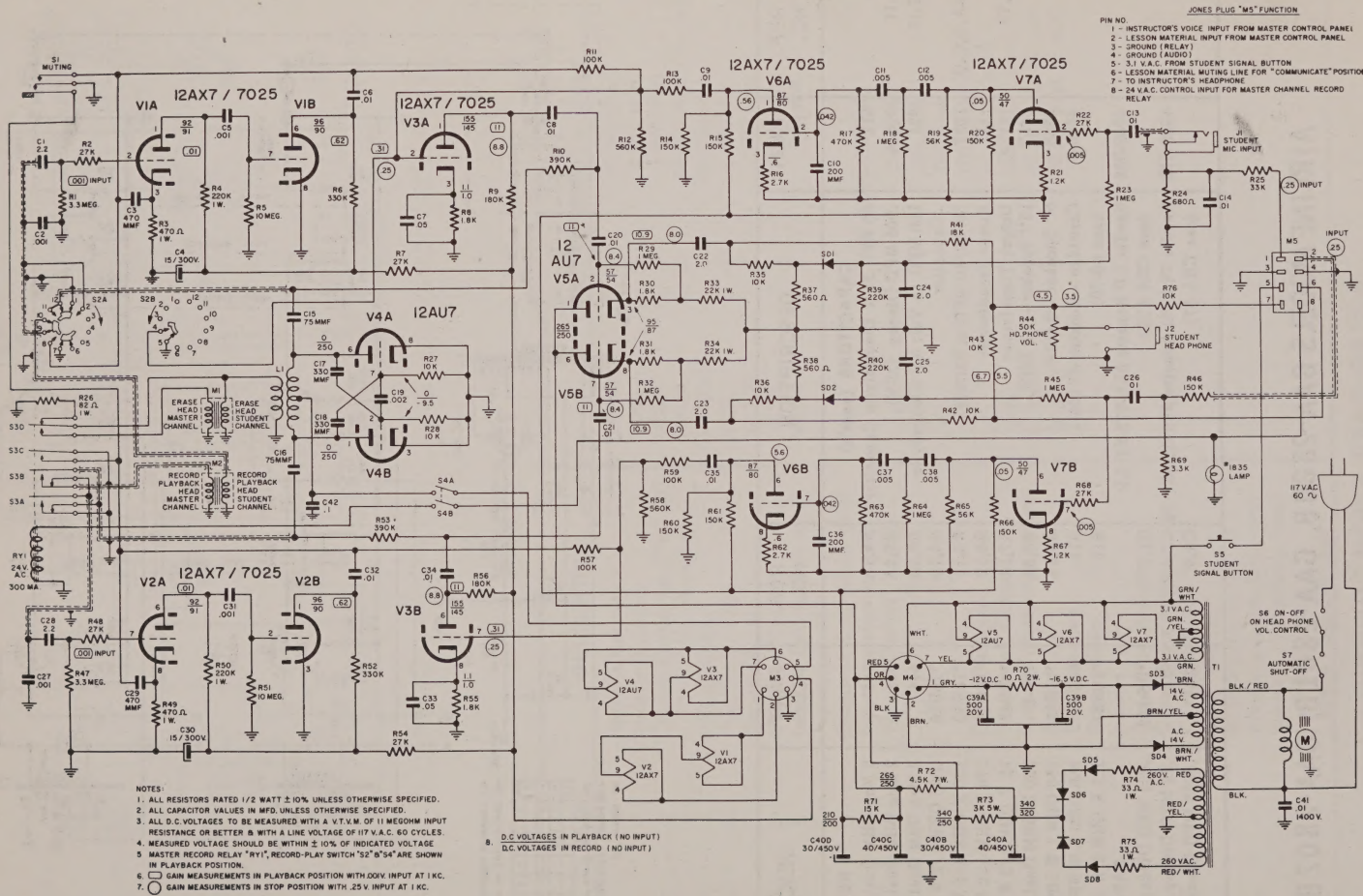
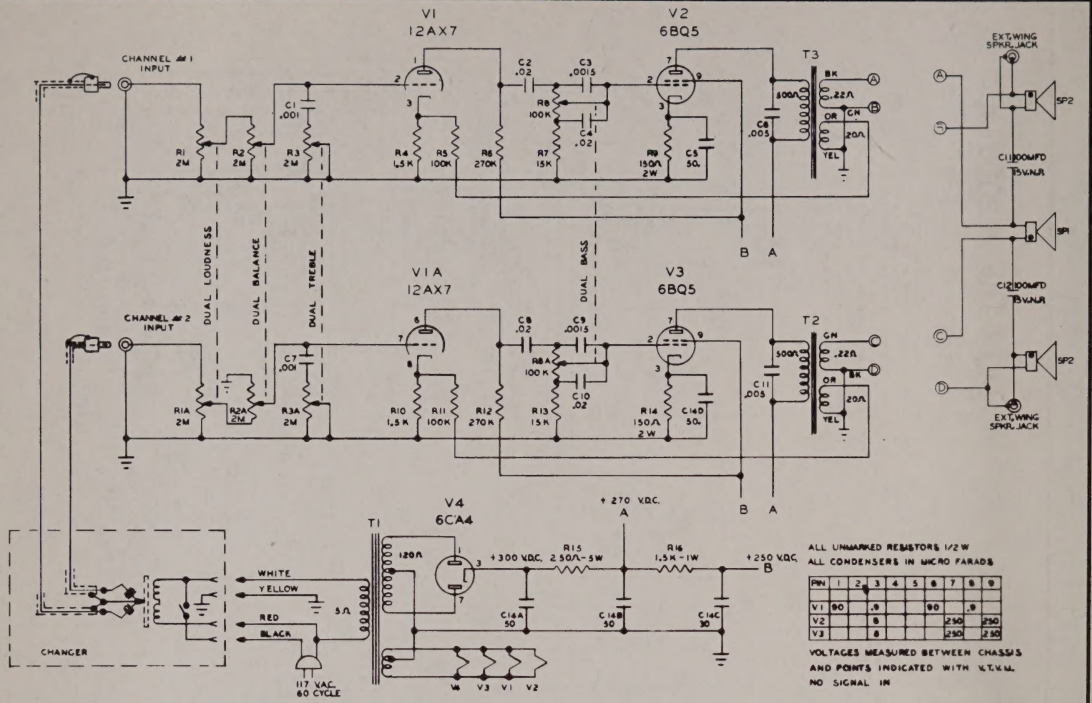

JONES PLUG "M5" FUNCTION
PIN NO.
1 - INSTRUCTOR'S VOICE INPUT FROM MASTER CONTROL PANEL
2 - LESSON MATERIAL INPUT FROM MASTER CONTROL PANEL
3 - GROUND (RELAY)
4 - GROUND (AUDIO)
5 - 3.1 V.A.C. FROM STUDENT SIGNAL BUTTON
6 - LESSON MATERIAL MUTING LINE FOR "COMMUNICATE" POSITION
7 - TO INSTRUCTOR'S HEADPHONE
8 - 24 V.A.C. CONTROL INPUT FOR MASTER CHANNEL RECORD RELAY
S1 MUTING
V1A 12AX7 / 7025
V1B
V3A 12AX7 / 7025
V6A 12AX7 / 7025
V7A 12AX7 / 7025
V4A I2AU7
V5A I2 AU7
V4B
V5B
V6B
V7B
V2A 12AX7 / 7025
V2B
V3B
001 INPUT
J1 STUDENT MIC INPUT
J2 STUDENT HEAD PHONE
M5 INPUT
HD.PHONE VOL.
ERASE HEAD MASTER CHANNEL
ERASE HEAD STUDENT CHANNEL
RECORD PLAYBACK HEAD MASTER CHANNEL
RECORD PLAYBACK HEAD STUDENT CHANNEL
S5 STUDENT SIGNAL BUTTON
S6 ON-OFF ON HEAD PHONE VOL. CONTROL
S7 AUTOMATIC SHUT-OFF
117 V.A.C. 60 ~
RY1 24 V. A.C. 300 MA
T1
M
NOTES:
1. ALL RESISTORS RATED 1/2 WATT ± 10% UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITOR VALUES IN MFD. UNLESS OTHERWISE SPECIFIED.
3. ALL D.C. VOLTAGES TO BE MEASURED WITH A V.T.V.M. OF 11 MEGOHM INPUT RESISTANCE OR BETTER ⊕ WITH A LINE VOLTAGE OF 117 V.A.C. 60 CYCLES.
4. MEASURED VOLTAGE SHOULD BE WITHIN ± 10% OF INDICATED VOLTAGE.
5. MASTER RECORD RELAY "RY1", RECORD-PLAY SWITCH "S2" & "S4" ARE SHOWN IN PLAYBACK POSITION.
6. ▭ GAIN MEASUREMENTS IN PLAYBACK POSITION WITH .001V. INPUT AT 1 KC.
7. ◯ GAIN MEASUREMENTS IN STOP POSITION WITH .25 V. INPUT AT 1 KC.
8. D.C VOLTAGES IN PLAYBACK (NO INPUT)
D.C. VOLTAGES IN RECORD (NO INPUT)

WEBCOR MODEL 2151

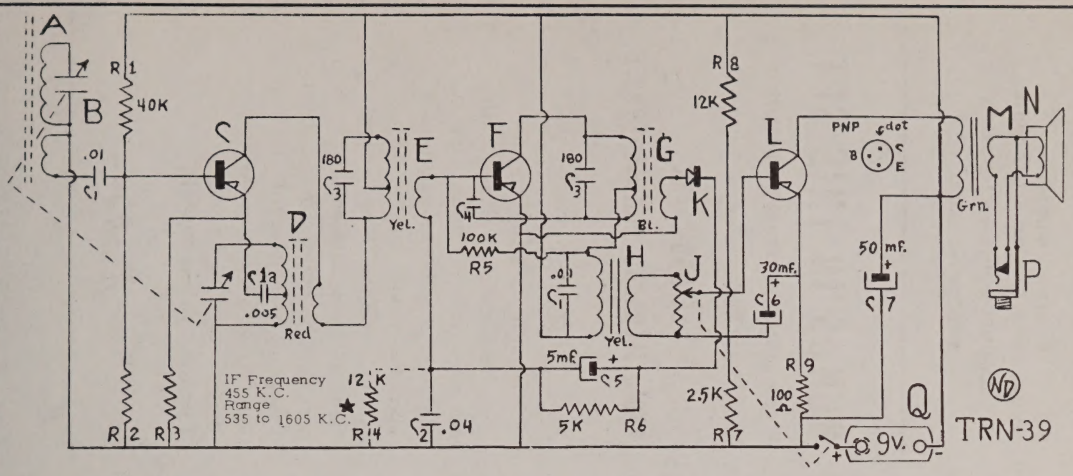
Schematic Diagram Courtesy of Webcor, Inc.



REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
		CAPACITORS (cont'd)			RESISTORS
C5	918	50 MFD 25 V Electrolytic Capacitor	R1,1A	444	2 Meg OHM Dual Loudness Control
C6,11	906-A	.005 MFD Discap (2KV)	R2,2A	445	2 Meg OHM Dual Balance Control
C12,13	924	100 MFD 15 Volt NP Electrolytic Capacitor	R3,3A	444	2 Meg OHM Dual Treble Control
			R4,10	*10H36	1500 OHM 1/2 W 10% Resistor
C14A,B,C,D	1037	50/50/30 MFD at 350VDC	R5,11	*10H50	100 K OHM 1/2 W 10% Resistor
T1	1111	Power Transformer	R6,12	*10H53	270 K OHM 1/2 W 10% Resistor
T2,T3	1217-C	Output Transformer	R7,13	*10H42	15 K OHM 1/2 W 10% Resistor
	2657	12" Speaker - 3.2 OHM	R8,8A	427-B	100 K OHM Dual Bass Control
	2658	6" Speaker - 8 OHM	R9,14	*11H55	150 OHM 1 W 10% Resistor
	4008-S	Cartridge - Ronette #P105-1 (use 60-79)	R15	635-A	250 OHM 5 W WW Resistor
			R16	*10H87	1.5 K OHM 1 W 20% Resistor
	4008-S33	Needle LP Ronette #SA-075-ST LP (use CRA 57X)			CAPACITORS
			C1,7	*D6-102	.001 MFD Discap
	4008-S78	Needle 78 RPM Ronette #SA-250-ST 78 (use CRA 57)	C2,4,8,18	920	.02 MFD Discap
			C3,9	821	.0015 MFD Discap

AIRLINE MODELS GAA-2800B, GAA-2801B, GAA-2802B

Information Courtesy of Montgomery Ward & Company



PARTS LIST

ORDER PART NO.	DIAG. DESIG.	DESCRIPTION
L-2	A	Antenna Loopstick
L2-BC	-	Antenna Bushing
35.10.6	B	Tuning Condenser (PVC-2X)
TCS	-	" "Mtg. Screws pr.
T-KW	-	Tuning Knob
2SA101A	C	Transistor, First detector & osc.
FTO	D	Oscillator Coil
T-2	E	Input IF Coil (yellow core)
2SA101AA	F	Transistor, IF
T-3	G	Output IF Coil (black core)
3T1	H	Input Transformer (yellow)
R1-E	J	Volume Control
R1-M	-	" " Mtgs.
R1-KW	-	" " Knobs
R1-KS	-	" " " screw
OA-908	K	Diode Detector
2SB176	L	Transistor, Output
60C	M	Output Transformer (green)
S-1	N	Speaker 2¼"
J-1	P	Earphone Jack
B-3	Q	Battery Snap
H-1C	-	Handle
CFBC	-	Case Front & Back
CFOO	-	Case, Front only
CBOW	-	Case, Back only
CNP	-	Case Nuts, pr.
MBP	-	Mounting Studs, pr.
EP-1	-	Earphone (accessory item)
17-399	-	Battery (accessory item)
CLC	-	Leather Case
EP-1C	-	Leather earphone case

"R" RESISTORS – ¼ watt		
SR40K	1	40,000 ohm.
SR8K	2	8,000 ohm.
SR2K	3	2,000 ohm.
SR12K	4	12,000 ohm. (if used)
SR100K	5	100,000 ohm.
SR5K	6	5,000 ohm.
SR2.5K	7	2,500 ohm.
SR12K	8	12,000 ohm.
SR100	9	100 ohm.

"C" CONDENSERS		
103P	1	.01 disk
502P	1a	.005 disk
D04	2	.04 disk
D180	3	180 disk (mmf)
D2	4	2 disk (mmf)
SF56	5	5mf. 6 or 10 volt
SF306	6	30 mf. 6 or 10 volt
SF5010	7	50 mf. 6 or 10 volt

CORONADO MODEL RA60-9918A

Information Courtesy of Gamble-Skogmo, Inc.

The PHOTOFACT® Servicer

SET 561 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JAN. 1962

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GAA-2800B, GAA-2801B; GAA-2802B
CORONADO MODEL RA60-9918A
WEBCOR MODEL 2151

BONUS IN THIS SET

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Cordially,

Howard W. Sams

PHOTOFACT® Folder with CIRCUITRACE®

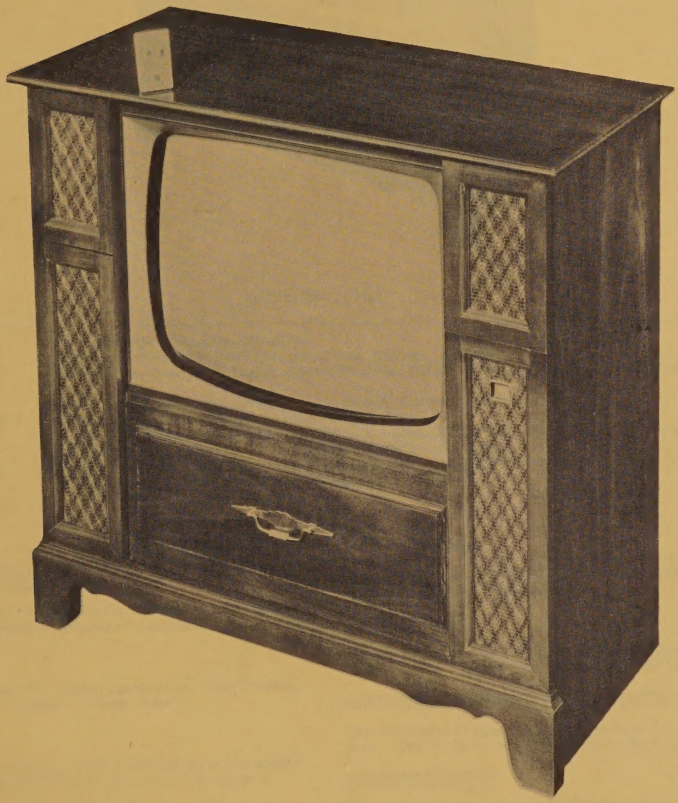
AIRLINE MODELS
WG-5218A, WG-5219A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

AIRLINE MODELS
WG-5218A, WG-5219A



MODEL WG-5218A

AIRLINE MODELS
WG-5218A, WG-5219A

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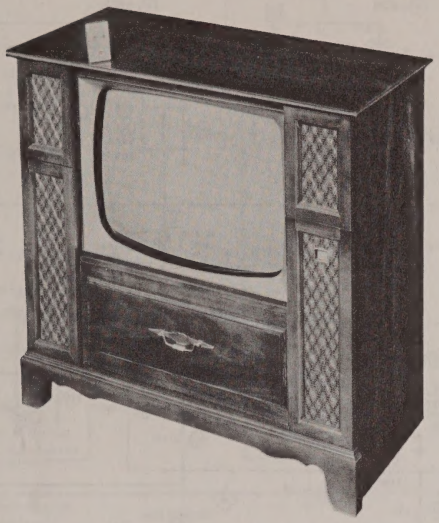

MODEL WG-5218A

TRADE NAME	Airline, Models WG-5218A, WG-5219A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois
TYPE SET	Television Receiver (With Remote Control Receiver 7E2AW or 7E2DW; Transmitter 26A718)
TUBES	TV: Seventeen
TRANSISTORS	Remote Control Receiver: Seven Remote Control Transmitter: One
POWER SUPPLY	110-120 Volts AC, 60 Cycle (Transmitter 4.2V Battery)
RATING	TV with Remote Control Receiver: 185 Watts, 1.8 Amp. @ 117 Volts AC (210 Watts, 2.1 Amp. While Tuning) Transmitter: 20MA @ 4.2V DC Receiver: 2 Watts, .002 Amp.
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) (UHF Channel conversion by use of strips in VHF Tuner)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

It is necessary to remove chassis and picture tube for access to safety glass(for cleaning or removal).

FUSE

A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis - Bottom View".)

FUSE DEVICE

A 4.5Ω fusible resistor is used for low voltage power supply protection. (see R95 in photo "Chassis - Top View".)

TUNER OSCILLATOR ADJUSTMENT

To touch up VHF Oscillator, remove emblem from escutcheon behind control panel door.

AGC

The AGC may be varied by means of an(AGC)Range control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Chassis - Top View.)

SYNC STABILITY

Sync stability may be varied by means of a Sync Stability Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz Control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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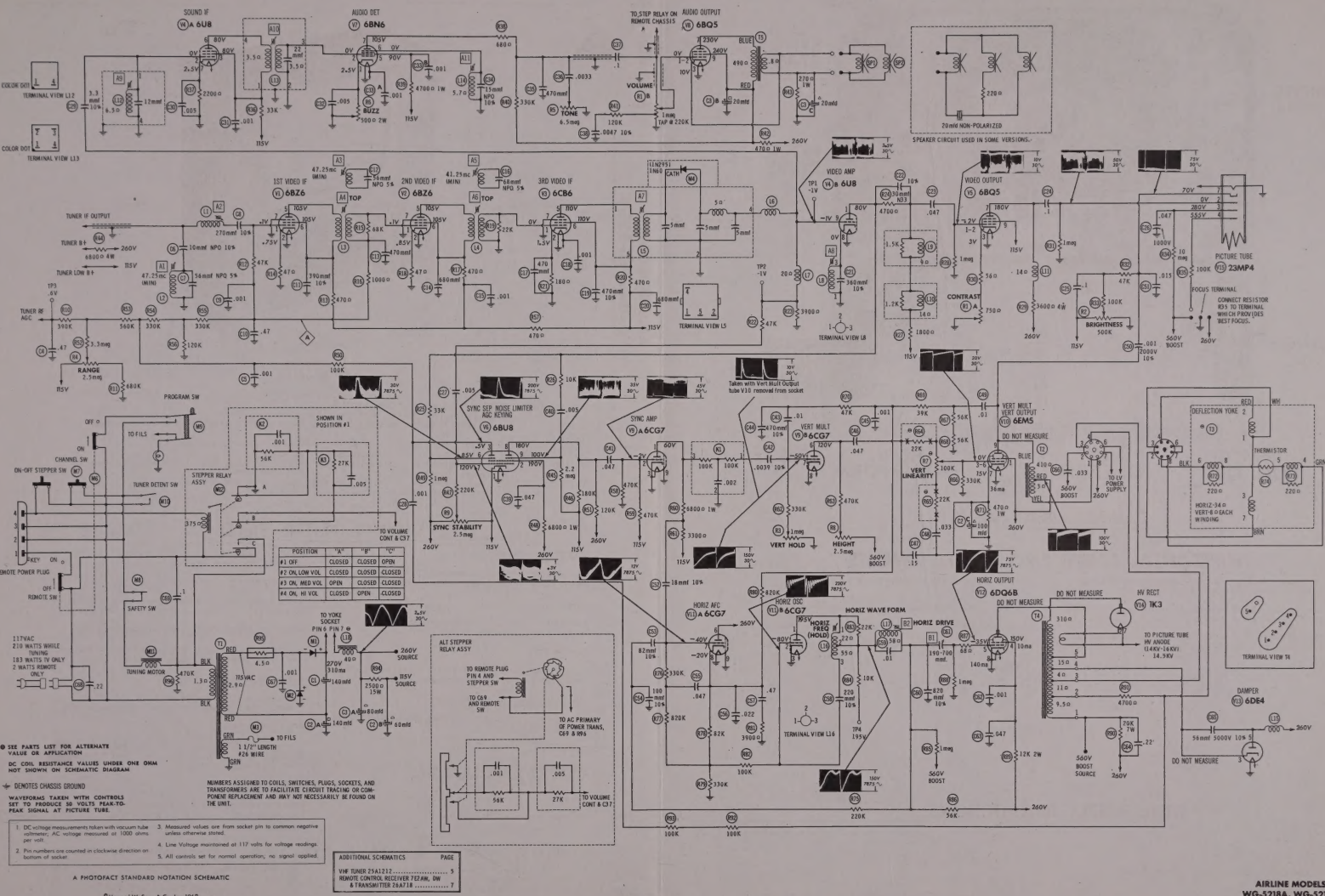
AIRLINE MODELS
WG-5218A, WG-5219A

SET 561 FOLDER 1



POSITION	"A"	"B"	"C"
#1 OFF	CLOSED	CLOSED	OPEN
#2 ON, LOW VOL	CLOSED	CLOSED	CLOSED
#3 ON, MED VOL	OPEN	CLOSED	CLOSED
#4 ON, HI VOL	CLOSED	OPEN	CLOSED

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

⏚ DENOTES CHASSIS GROUND

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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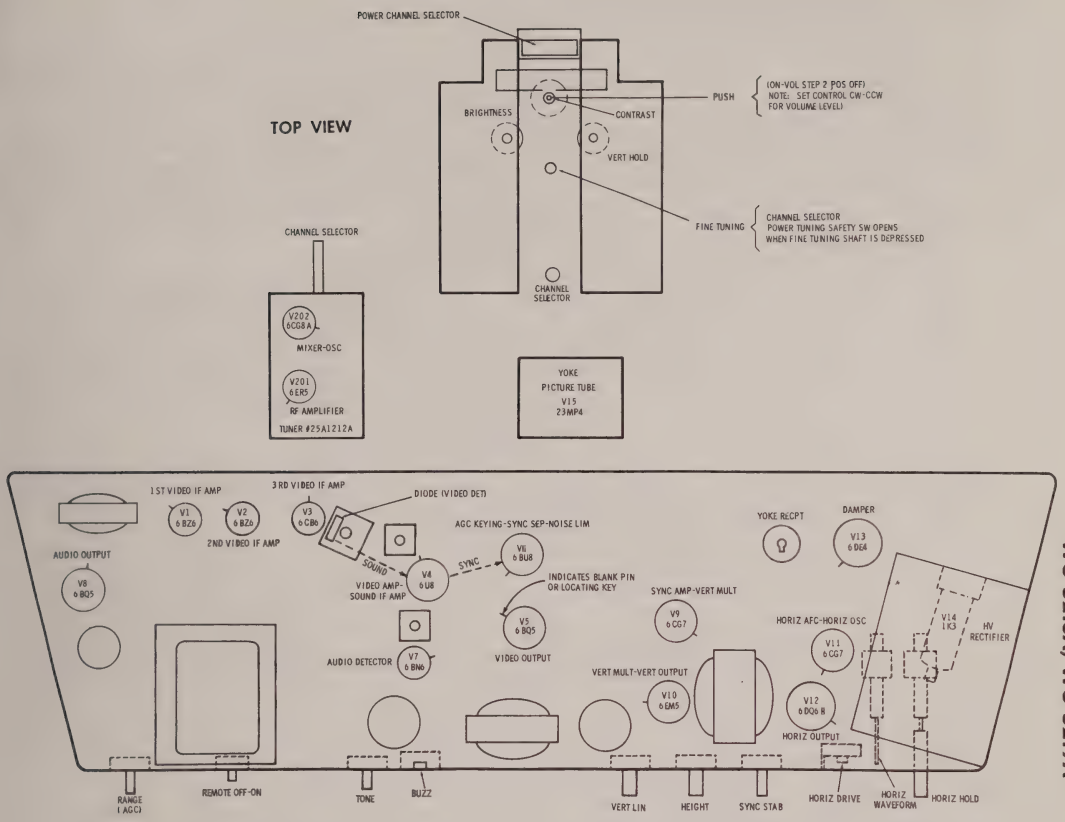
ADDITIONAL SCHEMATICS	PAGE
VHF TUNER 25A1212	5
REMOTE CONTROL RECEIVER 7GZAW, ON & TRANSMITTER 26A718	7

AIRLINE MODELS WG-5218A, WG-5219A

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Resistor (Fusible), Fuse Wire (Fil.), Rectifiers M1, M2

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, M1, M2
Vert. off freq. V9, V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V15
Has pic, no sound V4, V7, V8
Overloaded picture V6

SYNC FAILURE
No vert. sync V6, V9
No horiz. sync V6, V9
No vert. or horiz. sync V6, V9

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8505L or 9295
WALSCO #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp.)	47.25MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 1) to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 2.
2.	"	"	"	41.25MC 45.75MC 47.25MC	"	"	A2, A3, & Mixer Plate Coil	Adjust for response similar to Fig. 2. Mixer Plate Coil and A2 affect the shape of the top. A3 is adjusted to position the 47.25MC marker.
3.	"	"	"	42.8MC	"	Vert. Amp. thru 10K to TP-1. Low side to chassis. DC probe of VTVM thru 10K to same point. Common to chassis. (Across Video Det. Load)	A4	Increase bias at point (A) to 4.5 volts. Adjust sweep output for -2 volts DC at TP-1. Adjust A4 for maximum amplitude at marker.
4.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM amplitude at marker.
5.	"	"	"	45.3MC	"	"	A6	Adjust for maximum gain at marker.
6.	"	"	"	44.0MC	"	"	A7	"
7.	"	"	"	41.25MC 42.4MC 42.8MC 44.0MC 44.5MC 45.3MC 45.75MC 47.25MC	"	"		Check for response similar to Fig. 3 with markers as shown. If necessary, retouch A2 thru A7 for desired response. A7 controls the symmetry of the top. A6 controls position of the 45.75MC marker. A4 controls position of the 42.4MC marker (this slug will seldom need retouching). CAUTION: The position of 44.5MC marker is very critical (98%).

4.5MC TRAP ALIGNMENT

Use 0-10 volts AC scale on VTVM.
Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.005mfd	High side to pin 9 (grid) of 6U8 (V4). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	RF probe to pin 2 (grid) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV signal and reduce signal level at the antenna terminals, by use of an attenuator or similar device, until a hiss similar to super-regeneration is heard in the sound.
Adjust A9, A10 and A11 for maximum undistorted sound.
Adjust the Buzz Control for MINIMUM buzz.

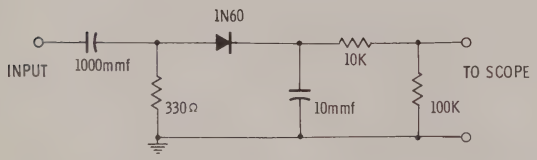


FIG. 1

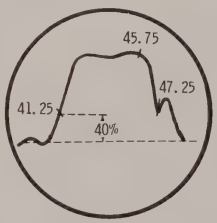


FIG. 2

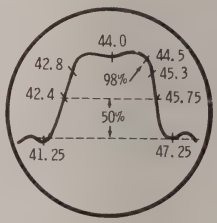
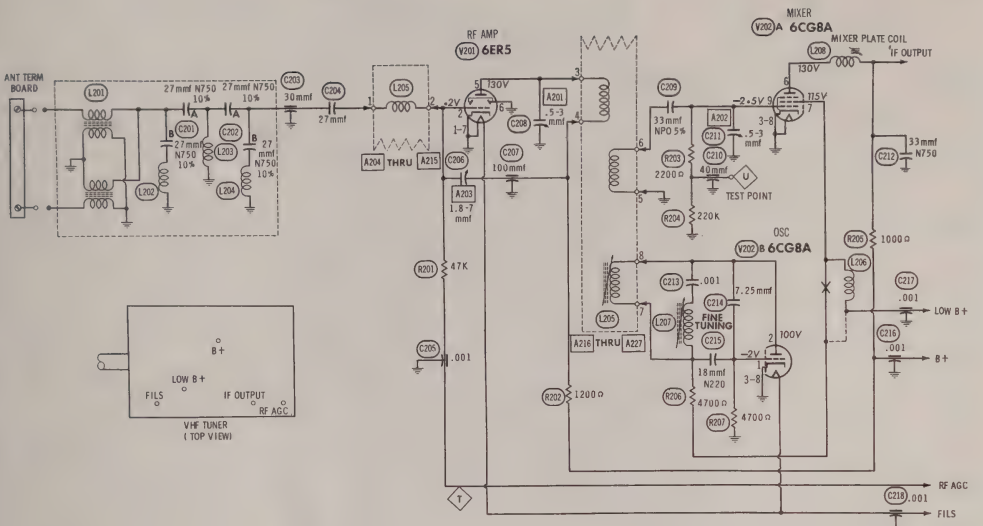


FIG. 3



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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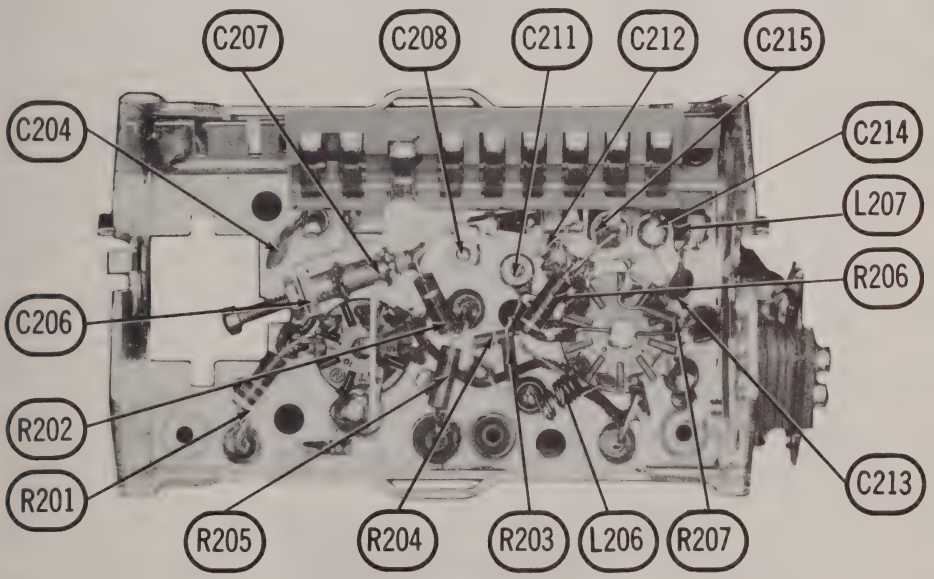
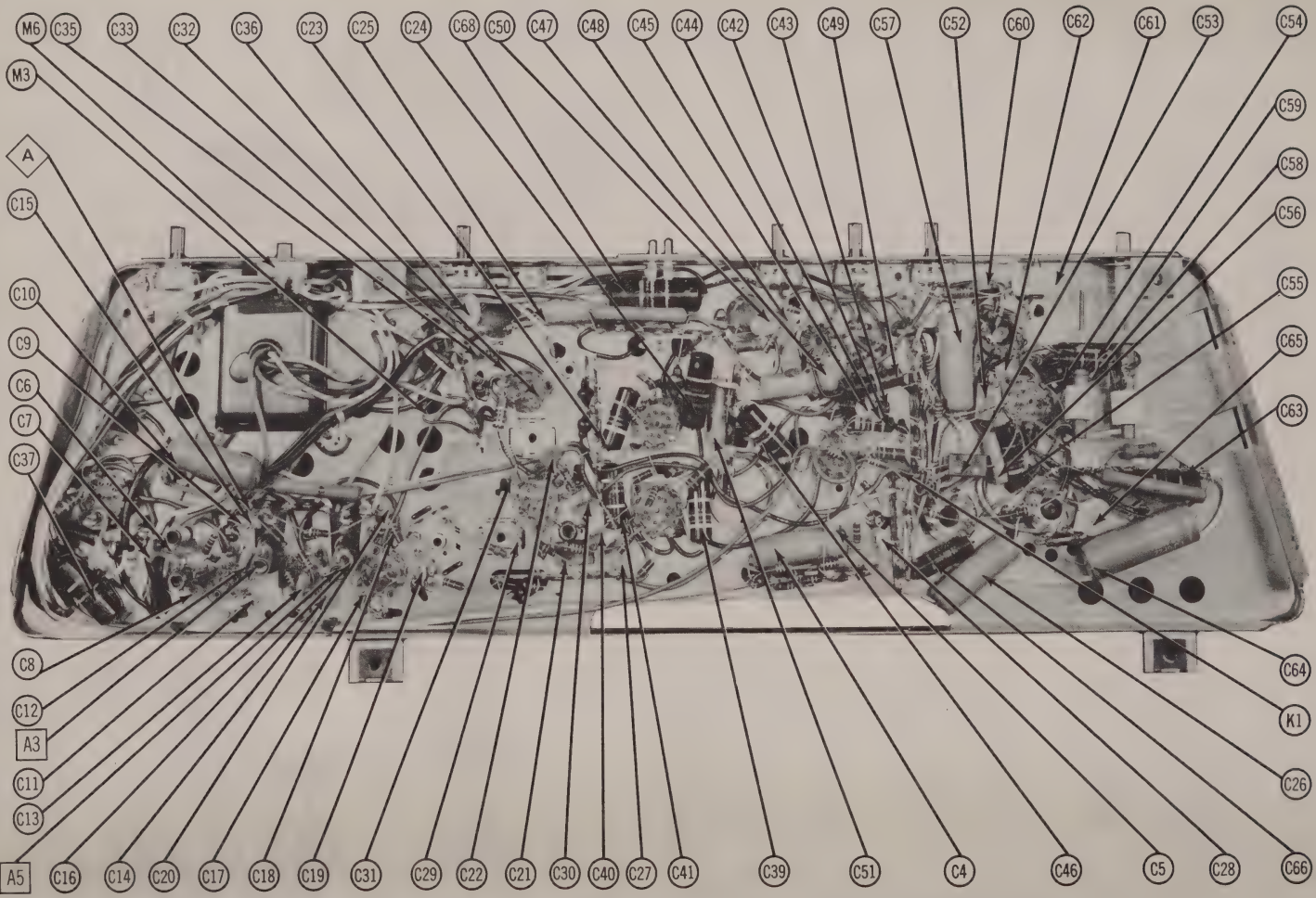
VHF TUNER 25A1212

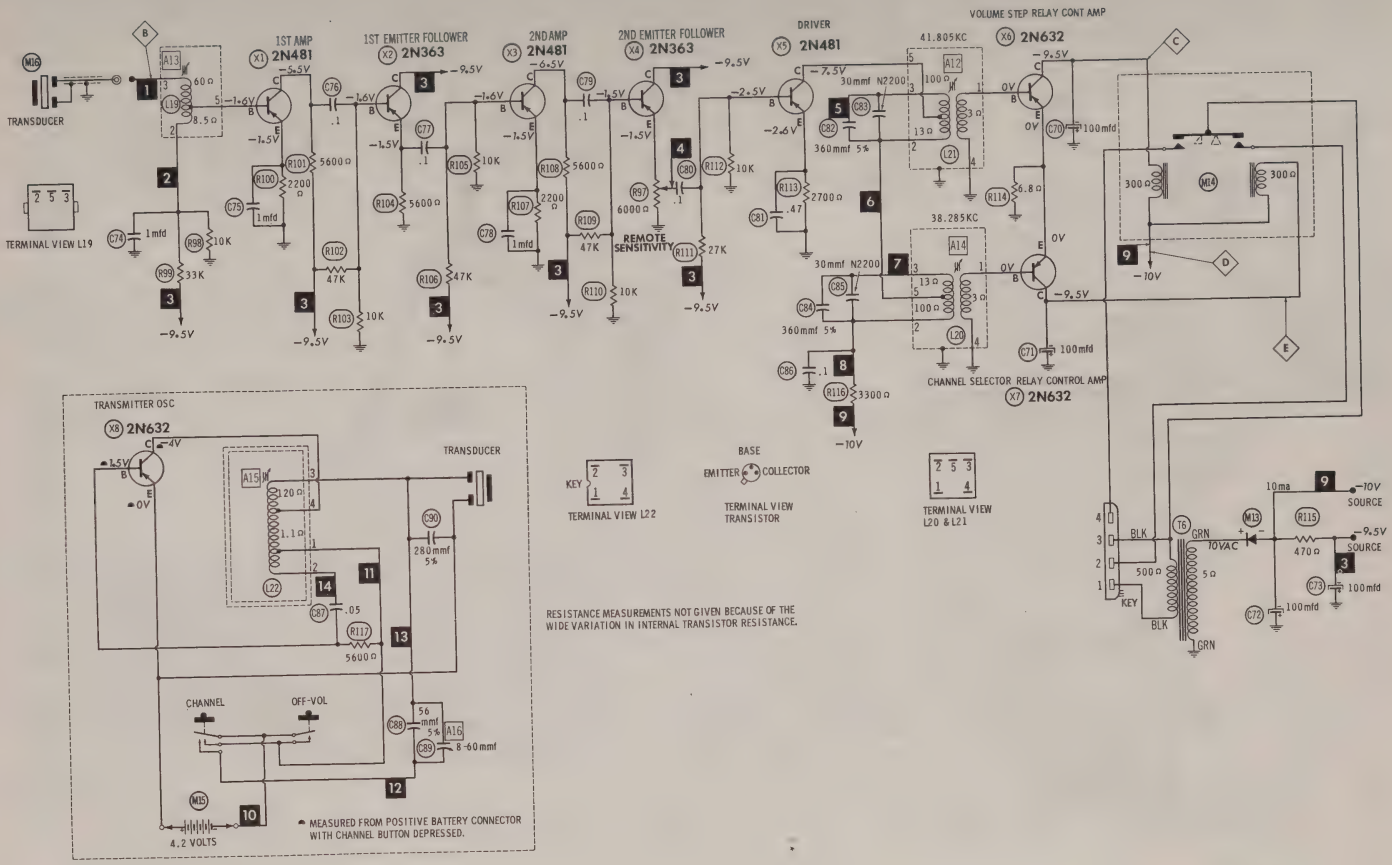


VHF TUNER - BOTTOM VIEW

SET 561 FOLDER 1



TV CHASSIS BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.



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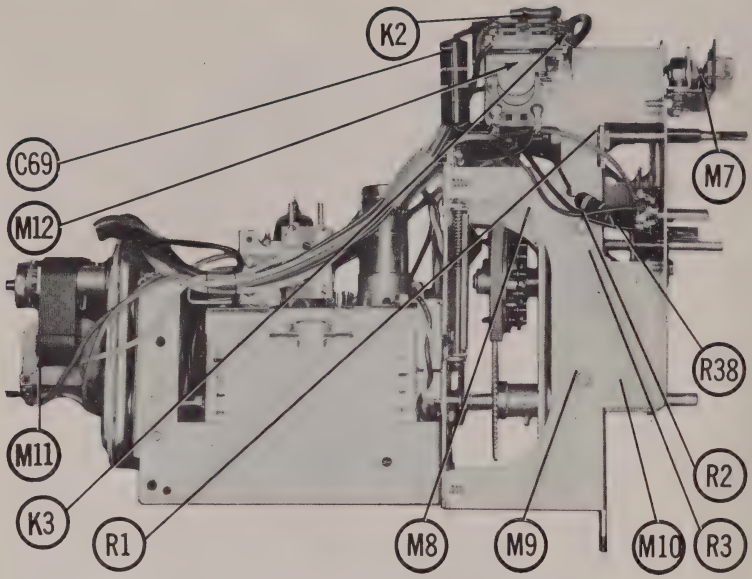
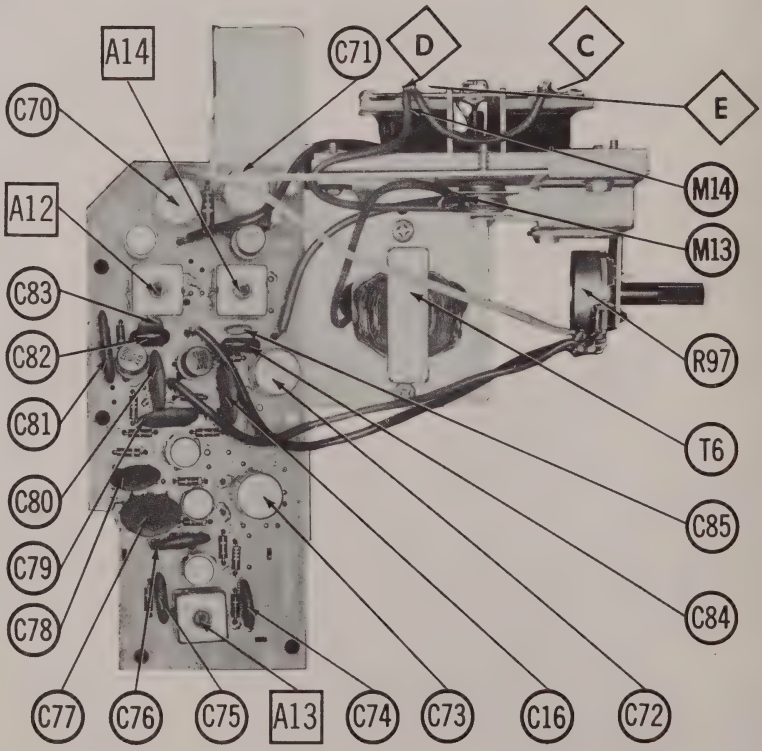
REMOTE CONTROL RECEIVER 7E2AW, DW & TRANSMITTER 26A718



POWER TUNING ASSEMBLY



REMOTE CONTROL RECEIVER

REMOTE CONTROL RECEIVER PARTS LIST (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R37A B	6000Ω Dual	½	75D30-107	AB-13 AK-19		B11-115 T46	RU63L SL-3500 *	Remote Sensitivity * Use Bushing SL-38

RESISTORS

All wattages 1/2 watt, or less, unless otherwise stated.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R98	10K				R108	5600Ω			
R99	33K				R109	47K			
R100	2200Ω				R110	10K			
R101	5600Ω				R111	27K			
R102	47K				R112	10K			
R103	10K				R113	3700Ω			
R104	5600Ω				R114	6.8Ω			
R105	10K				R115	470Ω			
R106	47K				R116	3300Ω			
R107	2200Ω								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L29	Input Coil	69C251-1				TB678	
L30	38.385KC Trans.	69C248-1				TB677	
L31	41.805KC Trans.	69C248-1				TB677	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T9	117V @ 60 CY	10VAC @ .002A	210A AC	80B74-1					

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA AIRLINE PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M13	.010A	93B24-1			

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M14	Function Relay & Mechanical Disc Microphone Printed Board	83C33-1 78B147-1 72A4W	Complete Remote Receiver Assembly, Includes All Components

REMOTE CONTROL TRANSMITTER PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA RCA PART No.	RAYTHEON PART No.	NOTES
X8	2N632	Osc.	2N410	2N632	PNP

FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C87	.05	10V		C80V503AM	UK20-503	S-05S5		TA-150	HY-310
C88	56	5%	#65B7-9	1469-000058	TCZ-56	22S5Q56	CM-19B-56J 404	CNO-456	MS-456
C89	8-60						CM-19B-27J		
C90	280	5%		1469-000270	TCZ-270	5R5T27		CNO-456	MS-327

Airline Part Number

RESISTORS

All wattages 1/2 watt, or less, unless otherwise stated.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS	ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R117	5600Ω								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L22	Osc. Coil	69B267-1					

REMOTE CONTROL TRANSMITTER PARTS LIST (Cont'd)

BATTERIES

ITEM No.	VOLTAGE	AIRLINE PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M15	4.2V	TR-163		H63		H163		TR-163	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M16	Transducer Printed Board	78B178-1 26A718	Remote Control Selector (Transmitter), Complete, Includes All Composents

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Case Case Pushbutton	33E458-2 34X524-1 33B462-1	Bottom Top

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	TYPE	ITEM No.	RAYTHEON • SYLVANIA • USE	TYPE
V201	RF Amp.	6ER5	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201A	27	N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
B	27	N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203A	27	N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
B	27	N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	30		13M-030-06 †						
C204	27			NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C205	.001			EF-001	MFT-1000		CCF-102	CT280A	
C206	1.8-7				S29-7				
C207	100			EF-0001	MFT-100				
C208	.5-3				S29-3		CV-1	CT585	
C209	33	NPO 5%			DTZ-33	C10Q33C		CNO-433	10TCC-Q33
C210	40		13M-009 †						
C211	.5-3				S29-3		CV-1	CT565	
C212	33	N750		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C213	.001			BPD-001	DD-102	BYA10IX	CCD-102	B-210	5HK-D10
C214	7.25		13R-052 †				*		10TCR-Q28
C215	18	N220	13R-032 †						
C216	.001			EF-001	MFT-1000		CCF-102	CT280A	
C217	.001			EF-001	MFT-1000		CCF-102	CT280A	
C218	.001			EF-001	MFT-1000		CCF-102	CT280A	

† STANDARD COIL Part Number

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

COILS (RF-IF)

ITEM No.	USE	PART No. *	NOTES
L201	Ant. Trans.	31T-3870-02	Includes Input Assembly
L202	RF Choke	34A-1078	
L203	RF Choke	34A-1063	
L204	RF Choke	34A-1078	
L205A	Ant., RF, Mixer, Osc.		
A	"	31M-2GG4	Channel 2
B	"	31M-3GG4	Channel 3
C	"	31M-4GG4	Channel 4
D	"	31M-5GG4	Channel 5
E	"	31M-6GG4	Channel 6
L205F	Ant. RF, Mixer, Osc.	31M-7GW4	Channel 7
G	"	31M-8GW4	Channel 8
H	"	31M-9GW4	Channel 9
J	"	31M-10GW4	Channel 10
K	"	31M-11GW4	Channel 11
L	"	31M-12GW4	Channel 12
M	"	31M-13GW4	Channel 13
L206	RF Choke	25A-239	
L207	Fine Tuning	34A-787-04	Slug Pt. #9E-615
L208	Mixer Plate	31U-830-01	

* STANDARD COIL Part Number

RESISTORS

All wattages 1/2 watt, or less, unless otherwise stated.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS	ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	1000Ω			
R202	1200Ω				R206	4700Ω			
R203	2200Ω				R207	4700Ω			
R204	220K								

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	TYPE	ITEM No.	RAYTHEON • SYLVANIA • USE	TYPE
V1	1st Video IF Amp.	6BZ6	V7	Audio Detector	6BN6
V2	2nd Video IF Amp.	6BZ6	V8	Audio Output	6BQ5
V3	3rd Video IF Amp.	6CB6	V9	Sync Amp. - Vert. Mult.	6CG7
V4	Video Amp. - Sound IF Amp.	6U8	V10	Vert. Mult. - Vert. Output	6EM5
			V11	Horiz. AFC - Horiz. Osc.	6CG7
V5	Video Output	6BQ5	V12	Horiz. Output	6DQ6B
V6	AGC Keying - Sync Sep. - Noise Limiter	6BU8	V13	Damper	6DZ4
			V14	HV Rectifier	1B3

PICTURE TUBE

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V15	23MP4	23MP4 ①	23MP4 ①		23MP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	140	150	45X4E	AFHM-23	XA038I	EC1-18	WP125.5	TM5-1270	TVL-1438
C2A	140	150	45X464	AFH3-187-15	B9608	EC4-85	FP330.38	TMT-3410	TVL-2706.3
B	60	350			BR6035		TC48	TD-150-150	TVA-1432
C	100	50							
C3A	80	350	45X485	AFH4-07	C0370	EC3-27	FP531.3	TMT-3783	TVL-3793
B	20	350							
C	20	50							

FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.47	200V		P488N-47		CUB2P47	3DP-5-474	GEM-3047	2TM-P47
C5	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C6	10	NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C7	56	NPO 5%			TCZ-56	C10Q56C	CM-19B-560J	CNO-456	10TCC-Q56
C8	270	10%		DI-270	DD-271	L10T27	CCD-270	GP327	10TS-T27
C9	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C10	.47	200V		P283N-47		CUB2P47	3DP-5-474	GEM-3047	2TM-P47
C11	390	10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C12	56	NPO 5%			TCZ-56	C10Q56C	CM-19B-560J	CNO-456	10TCC-Q56
C13	470			DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C14	680			DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C15	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C16	68	NPO 5%			DTZ-68	C10Q68C	CM-19B-680J	CNO-468	10TCC-Q68
C17	470			DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C18	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C19	470	10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C20	680			DI-680	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C21	360	10%		1469-00036		5R5T36	CM-19B-361K		MS-336
C22	30	N33 10%	#47669				*		
C23	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C24	.1	400V		P488N-1	DD-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C25	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-301	4TM-P10
C26	.047	1000V		P1088N-047		CUB1D47	1SDP-5-473	GEM-10147	1TM-S47
C27	.005			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C28	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C29	3.3	10%		NPO-DI 3.3	DTZ-3R3	C10Y33C	CCTO-3R3	CNO-533	10TCC-Y33
C30	.005			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C31	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C32	.005			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C33A	.001						CCD-102		
B	.001			BPD-EX001	DD2-102	BYC5DDH	CCD-102	B2EX10	5HK-X280
C34	18	NPO 10%					*		
C35	470			NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C36	.0033			DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C37	.1	400V		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C38	.047	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C39	.0047	400V	10%	V84C4D47-10		PM6D47	6DP-1-472	JL-247	6TM-D47
C40	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C41	.005			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C42	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C43	.0039	400V	10%	DP488D39		DP4S8D39	4DP-1-392	JL-239	4TM-D39
C44	.01	400V		P488N-01	D6-103	CUB6S1	6DP-1-103	GEM-411	4TM-S10
C44	470		10%	DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C45	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C46	.047	600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C47	.15	200V		P288N-15		CUB2P15	2DP-3-154	GEM-4015	2TM-P15
C48	.033	200V		P288N-033	DD-303	CUB2S33	2DP-3-333	GEM-4133	2TM-S33
C49	.01	600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-511	6TM-S10
C50	.001	2000V	10%	#80X96-1					
C51	.018	600V		P688N-015	DD-153	CUB6S15	6DP-2-153	GEM-5115	6TM-S15
C52	18	10%		1469-000018	TCZ-18	22R5Q18	CM-19B-180K	CNO-418	MS-418
C53	82	10%		1469-000082	TCZ-82	22R5Q82	CM-19B-820K	CNO-482	MS-482
C54	100	10%		1469-000	TCZ-100	22R5T1	CM-19B-310K	MCB235	MS-310
C55	.047	200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C56	.022	200V		P288N-022	DD-203	CUB4S22	4DP-3-223	GEM-4122	4TM-S22
C57	.47	200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C58	220	10%		1469-00022	TCZ-220	22R5T22	CM-19B-221K	CNO-422	MS-322
C59	.01	400V		P488N-01	D6-103	CUB4P1	4DP-1-103	GEM-411	4TM-S10
C60	820	10%		1469-00082		5R5T82	CM-19B-821K		MS-382
C61	190-700		#17A276				469		
C62	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C63	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C64	.22	600V		P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22
C65	56	5000V 10%	#47X755					8DY-456	
C66	.033	200V		P288N-033	DD-303	CUB2S33	6DP-3-333	GEM-6133	6TM-S33
C67	.001			BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C68	.22	400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C69	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10

Airline Part Number

SET 561 FOLDER 1

TV PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	750Ω		73X41					Contrast
B	1meg ①							Volume & Switch (Stepper
R2A	500K		40X503	B-59	A47-500K-S	QU-133	TA55L	Brightness Motor)
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg		40X502	B-58	A47-1meg-S	QU-137	TA16L	Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4	2.5meg		40X466-3	TT-83	B47-2.5meg-S	HLC-3	TA255L	Range (AGC)
R5	6.5meg		40X483-2					Tone
R6	500Ω	2(WW)	40X473			110-500	PFL-500	Buzz
R7A	100K ②		40X485-2 ②	B-43	B47-150K-S	BU-338	TA184L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R8	2.5meg		40X466-2	TT-83	B47-2.5meg-S	HLC-3	TA255L	Height
R9	2.5meg		40X466-1	TT-83	B47-2.5meg-S	HLC-2	TA255L	Sync Stability

① Tap ④ 230K.
② 50K, 100K or 150K may be used in this application. Manufacturer recommends replacing all with 150K (Part #40X492-3) and shorting series resistors R84 and R85 (when replacement is necessary)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R10	390K				R54	330K			
R11	680K				R55	330K			
R12	47K				R56	120K			
R13	470Ω				R57	470Ω			
R14	47Ω				R58	470K			
R15	68K				R59	470K			
R16	1000Ω				R60	6800Ω 1W			
R17	470Ω				R61	3300Ω			
R18	47Ω				R62	330K			
R19	22K				R63	470K			
R20	470Ω				R64	22K			Note 1
R21	180Ω				R65	22K			Note 1
R22	47K				R66	330K			
R23	3900Ω				R67	56K			
R24	4700Ω				R68	56K			
R25	33K				R69	39K			
R26	10K				R70	47K			
R27	1800Ω				R71	470Ω 1W			
R28	1meg				R72	220Ω			
R29	3600Ω 4W	PW5-3600	5W-SQ-3600		R73	220Ω			
R30	56Ω				R74	(TC)			
R31	1meg				R75	220K			
R32	47K				R76	330K			
R33	100K				R77	820K			
R34	10meg				R78	82K			
R35	100K				R79	330K			
R36	33K				R80	820K			
R37	2200Ω				R81	3900Ω			
R38	680Ω				R82	100K			
R39	4700Ω 1W				R83	22K			
R40	330K				R84	10K			
R41	120K				R85	1meg			
R42	470Ω 1W				R86	56K			
R43	2700 1W				R87	68Ω			
R44	6800Ω 4W	PW5-6800	5W-SQ-6800		R88	1meg			
R45	2.2meg				R89	12K 2W			
R46	180K				R90	20K TW	PWT-20K	TW-SQ-20K	
R47	220K				R91	4700Ω			
R48	6800Ω 1W				R92	100K			
R49	1meg				R93	100K			
R50	100K				R94	2500Ω 15W	PW15-2500	15W-SQ-2500	
R51	120K				R95	4.5Ω	FR 4.5	R 4.5	Fusible
R52	3.3meg				R96	470K			
R53	560K								

Note 1. R64 (68K), R65 (22K) when a 50K Vertical Lin. Control is used,
R64 (22K), R65 (22K) when a 100K Vertical Lin. Control is used,
R64, R65 not used when a 150K Vertical Lin. Control is used.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE Part No.	REPLACEMENT DATA
K1	Vert. Integrator	.002mfd, 100K, 100K	76X19	
K2	Vol. Stepper Relay Coupling	.001mfd, 56K	76X36	
K3	Vol. Stepper Relay Coupling	.005mfd, 27K	76X36	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	1st Video IF	9A2385	TV-131	6226	RTC-8638	TZ18	① Includes Complete Assembly.
L2	47.25MC Trap	9A2481	TV-153	6225	RTC-8556	TZ16	② Wound on 1500Ω Resistor.
L2A	2nd Video IF	9A2383		6222	RTC-8553	TZ25	③ Wound on 1200Ω Resistor.
B	47.25MC Trap						† Shunt with 1500Ω Resistor.
L4A	3rd Video IF	9A3614		6231	RTC-8552	TZ24	▲ Shunt with 1200Ω Resistor.
B	41.25MC Trap						
L5A	4th Video IF	9A2370 ①		6240	RTC-9247	TG367	
B	Peaking (30ah)		TV-180	6176	RTC-8593	TZ06	
L6	Peaking (30ah)	9A2375	TV-180	6176	RTC-8593	TZ06	
L7	Peaking (360uh)	36A34	TV-190	6134	RTC-8578	TZ50	
L8	4.5MC Trap	9A2074	TV-151	1470	RTC-8603	TZ50	
L8	Peaking (80uh)	36A16 ②	TV-151 †	6172 †	RTC-8590 †	TZ03 †	
L10	Peaking (190uh)	36A49 ③	TV-197 ▲	6154 ▲	RTC-8596 ▲	TZ12 ▲	
L27	Peaking (190uh)	36A3	TV-197	6154	RTC-8596	TZ12	
L23	1st Sound IF	9A2434	TV-155	1470-A	RTC-8604	TZ47	
L13	2nd Sound IF	9A2368	TV-113	6303	RTC-8545	TZ35	
L14	Quadrature	9A2367	TV-121	1480	RTC-8605	TZ54	
L15	RF Choke (1.5uh)	9A2380	BC-562	4604	RTC-8516	TZ56	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	
L16	Horiz. Osc.	9A2481	TV-159	6211	RTC-8623	H8-7	WLC-25	T104	
L17	Horiz. Waveform	9A2372	MWC-13	6315	RTC-8628	H8-8	WLC-3	T110	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(A.)	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	
L18	.310A	40Ω	1.2 Hy.	52X104-1-A ①				C-28X	① Alternate Part #52X104

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	
T1	117V ⑤ 1.8A	115V ⑥ .920A	6.3V ⑥ 9.1A	53X383				R-124BC	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	51X223-1		VO-103 ①	26B07	A-140X	① Drill new mounting hole(s).
T3	Yoke (Horiz. 17.4MH) (114°) (Vert. 16MH)	8A-3484-1 †	MDF-131	DY-27A	Y-52	Y-60-1 ②	② Remove 470Ω Resistor across Vert. winding.
	Alt. Yoke	9A2494 †					† Includes rear cover and centering device.
	Yoke Clamp	30X628					
T4	Horiz. Output	53X394	HVO-186				

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

ORIGINAL TERMINAL CONNECTIONS	Merit Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5			
4	4			
3	3			
2	2			
1	1			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	6300Ω	3-4Ω	51X308	A-3026	A-3850①	24S51 ①	S-48X	① Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	4" x 6"	PM	6-8Ω	12A586A	46AU26.4	
SP2	4" x 6"	PM	6-8Ω	12A586A	46AU26.4	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	AIRLINE PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.310A	56X23	1N1763	40H	
M2	.310A	56X23	1N1763	40H	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						NOTES
			AIRLINE PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M3	1½"	length	#26 wire						

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		AIRLINE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M4	1N80 * 1N295 *			1N80 * 1N295 *	* Video Detector * Alternate Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M5	Tuner	25A-121A (25A122)	VHF Complete
M6	Switch	2A534	Remote Off-On (DPDT Slide Type)
M7	Switch	2A537-1	Push-Bar, Channel Selector (Power Tuning Assembly)
M8	Switch	2A538-1	Safety (Power Tuning Assembly)
M9	Switch	2A536-1	Programming (Power Tuning Assembly)
M10	Switch	22A-017-02	Detent, VHF Tuner (Power Tuning Assembly)
M11	Motor	23A227-1	Includes Drive Assembly (Power Tuning Assembly)
M12	Relay Assembly	2A539-1 or 2A538-2	Stepper (On-Off, Volume)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	26A712	Includes Gasket
Mask	43L581-1	
Touch Bar	10A1031	
VHF Channel Indicator	58X838-2	
Knob	10A832-1	On-Off Volume
Knob	10A1008-1	Brightness, Vertical
Knob	10A833-1	Contrast
Knob	10A1018-1	Horizontal Hold
Ring	20X1661	Compression (For Horizontal Hold Knob)

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8674
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

AIRLINE MODELS WG-5218A, WG-5219A

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2N481	1st Amplifier	2N410		PNP
X2	2N363	1st Emitter Follower	2N410	2N363	PNP
X3	2N481	2nd Amplifier	2N410		PNP
X4	2N363	2nd Emitter Follower	2N410	2N363	PNP
X5	2N481	Driver	2N408		PNP
X6	2N632	Volume Step Relay Control Amplifier	2N217	2N632	PNP
X7	2N632	Channel Selector Relay Control Amplifier	2N217	2N632	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C70	100	15	57C47-1	BCD15100	ECPB417	MT1-19	TT15X100	MLV100-15	VL-1180
C71	100	15	57C47-1	BCD15100	ECPB417	MT1-19	TT15X100	MLV100-15	VL-1180
C72	100	15	57C47-1	BCD15100	ECPB417	MT1-19	TT15X100	MLV100-15	VL-1180
C73	100	15	57C47-1	BCD15100	ECPB417	MT1-19	TT15X100	MLV100-15	VL-1180

FIXED CAPACITORS

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C74	1mfd	3V			UK-105				HY-135
C75	1mfd	3V			UK-105				HY-135
C76	.1	50V		C80V104AM	DA-104	H-05P1		TA-010	TG-P10
C77	.1	50V		C80V104AM	DA-104	H-05P1		TA-010	TG-P10
C78	1mfd	3V			UK-105				HY-135
C79	.1	50V		C80V104AM	DA-104	H-05P1		TA-010	TG-P10
C80	.1	50V		C80V104AM	DA-104	H-05P1		TA-010	TG-P10
C81	.47	10V			UK10-474				HY-330
C82	360	5%		1469-00036		5R5T36	CM-19B-361J		MS-336
C83	30	N2200	#65D10-189		TCZ-33		*		
C84	360	5%		1469-00036		5R5T36	CM-19B-361J		MS-336
C85	30	N2200	#65D10-189		TCZ-33		*		
C86	.1	50V		C80V104AM	DA-104	H-05P1		TA-010	TG-P10

Airline Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FOLDER 1

REMOTE CONTROL ALIGNMENT INSTRUCTIONS

RECEIVER

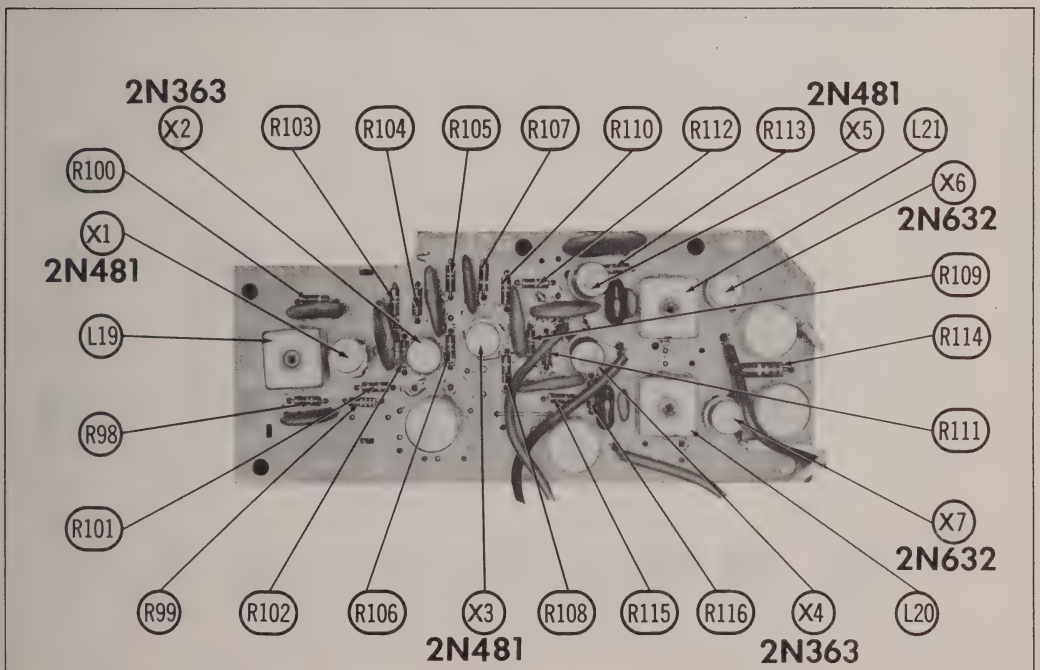
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	ADJUST	REMARKS
1.	Remove microphone. High side of signal generator thru 100K to point Ⓑ. Low side to chassis.	41.805KC	DC probe to point Ⓒ. Common to point Ⓓ.	A12, A13	Adjust for maximum deflection. Attenuate generator output to keep VTVM reading between 3 and 4 volts.
2.	"	38.285KC	DC probe to point Ⓔ. Common to point Ⓓ.	A14	"

TRANSMITTER

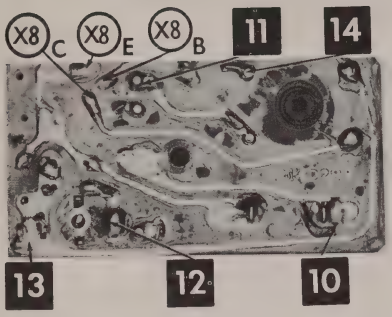
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	ADJUST	REMARKS
3.	NOT USED	NOT USED	DC probe to point Ⓒ. Common to point Ⓓ. (of receiver).	A15	Depress "Off-On-Volume" Switch spring leaf with a small screwdriver and adjust A15 for maximum deflection on VTVM.
4.	NOT USED	NOT USED	DC probe to point Ⓔ. Common to point Ⓓ.	A16	Depress "Channel" Switch spring leaf and adjust A16 for maximum deflection. If necessary, repeat steps 3 and 4.

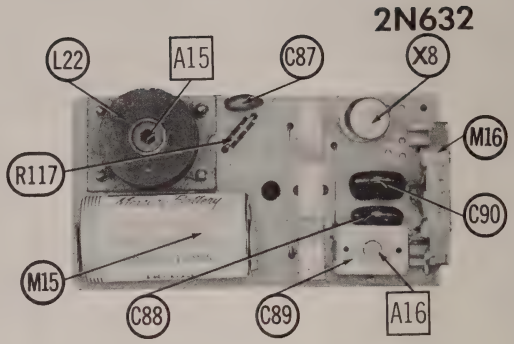
SENSITIVITY ADJUSTMENT

Place the transmitter near the receiver microphone and adjust the Sensitivity Control for 3 to 4 volts on VTVM (connected between points Ⓒ and Ⓓ with "Off-On-Volume" button depressed).



REMOTE CONTROL RECEIVER PRINTED BOARD—TOP VIEW

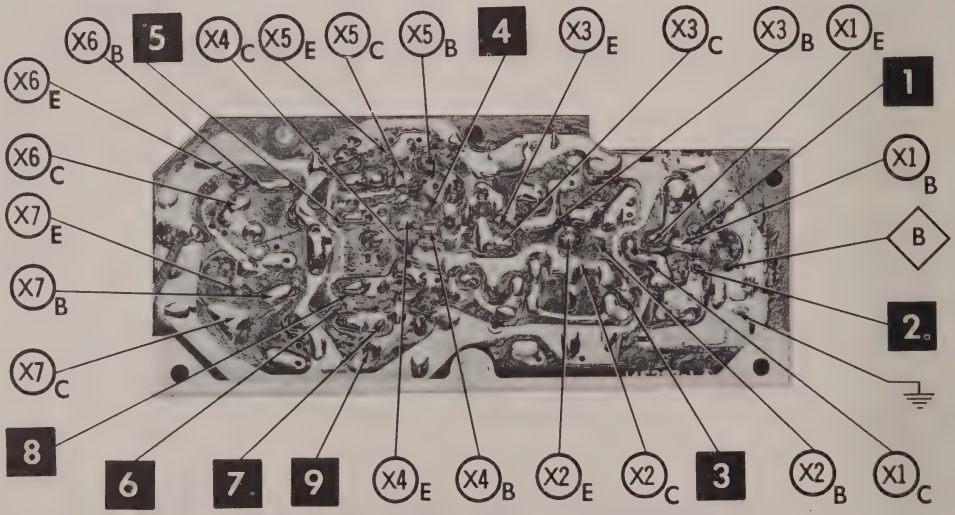




B - BASE C - COLLECTOR E - EMITTER

A Howard W. Sams CIRCUITRACE® Photo

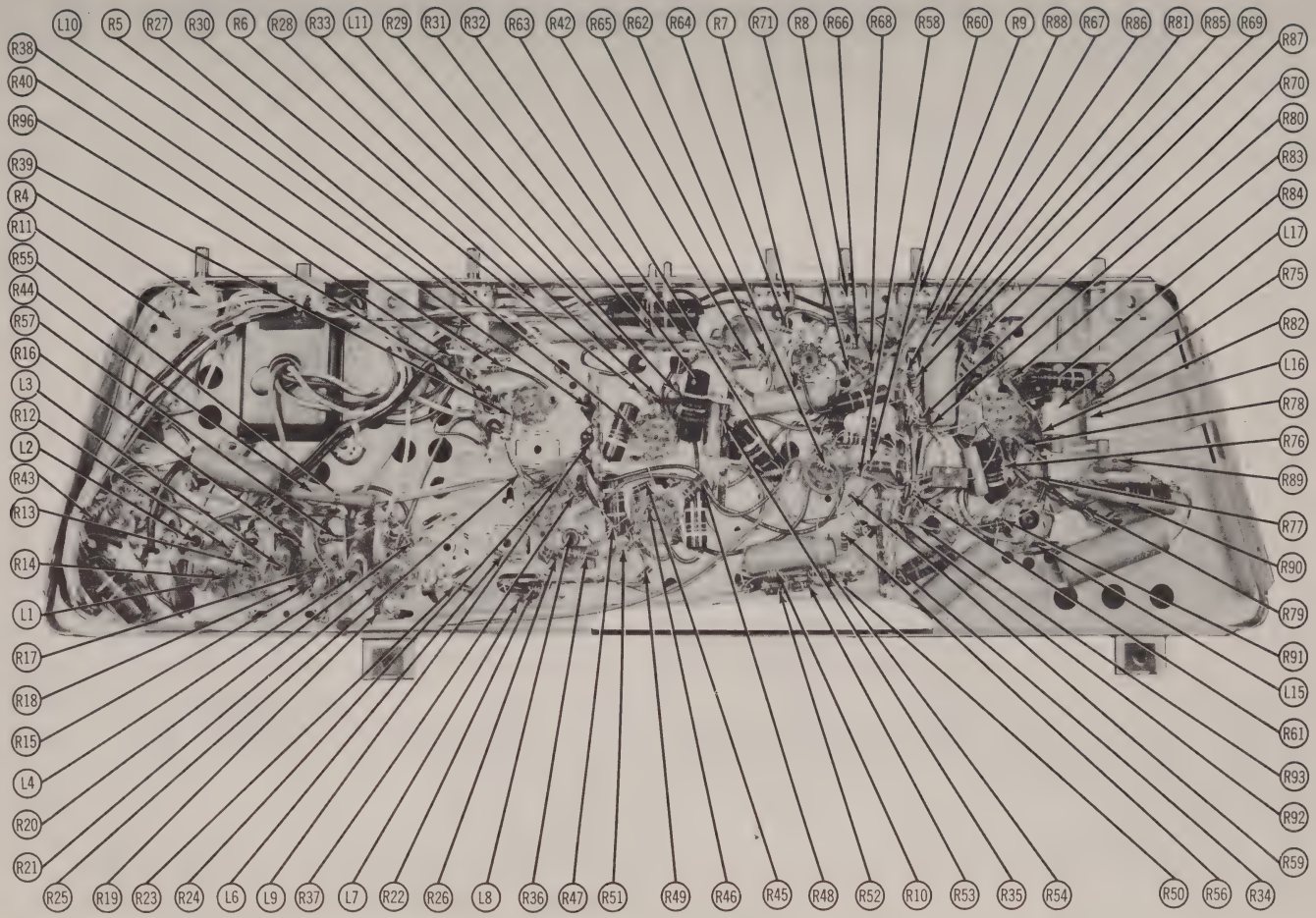
REMOTE CONTROL TRANSMITTER PRINTED BOARD



B - BASE C - COLLECTOR E - EMITTER

A Howard W. Sams CIRCUITRACE® Photo

REMOTE CONTROL RECEIVER PRINTED BOARD - BOTTOM VIEW



TV CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR IDENT.

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201, A202, A203 .... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a variable bias supply to point (T) . Positive to chassis. Set bias for 2.5 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (T) . Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A205	
		201MC	199.25MC 203.75MC	11		A206	
		195MC	193.25MC 197.75MC	10		A207	
		189MC	187.25MC 191.75MC	9		A208	
		183MC	181.25MC 185.75MC	8		A209	
		177MC	175.25MC 179.75MC	7		A210	
		85MC	83.25MC 87.75MC	6		A211	
		79MC	77.25MC 81.75MC	5		A212	
		69MC	67.25MC 71.75MC	4		A213	
		63MC	61.25MC 65.75MC	3		A214	
		57MC	55.25MC 59.75MC	2		A215	

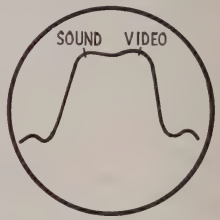


FIG. 201

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. Load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A217	
		201MC	199.25MC 203.75MC	11		A218	
		195MC	193.25MC 197.75MC	10		A219	
		189MC	187.25MC 191.75MC	9		A220	
		183MC	181.25MC 185.75MC	8		A221	
		177MC	175.25MC 179.75MC	7		A222	
		85MC	83.25MC 87.75MC	6		A223	
		79MC	77.25MC 81.75MC	5		A224	
		69MC	67.25MC 71.75MC	4		A225	
		63MC	61.25MC 65.75MC	3		A226	
		57MC	55.25MC 59.75MC	2		A227	

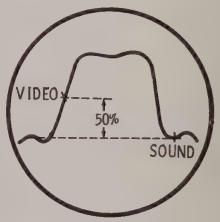
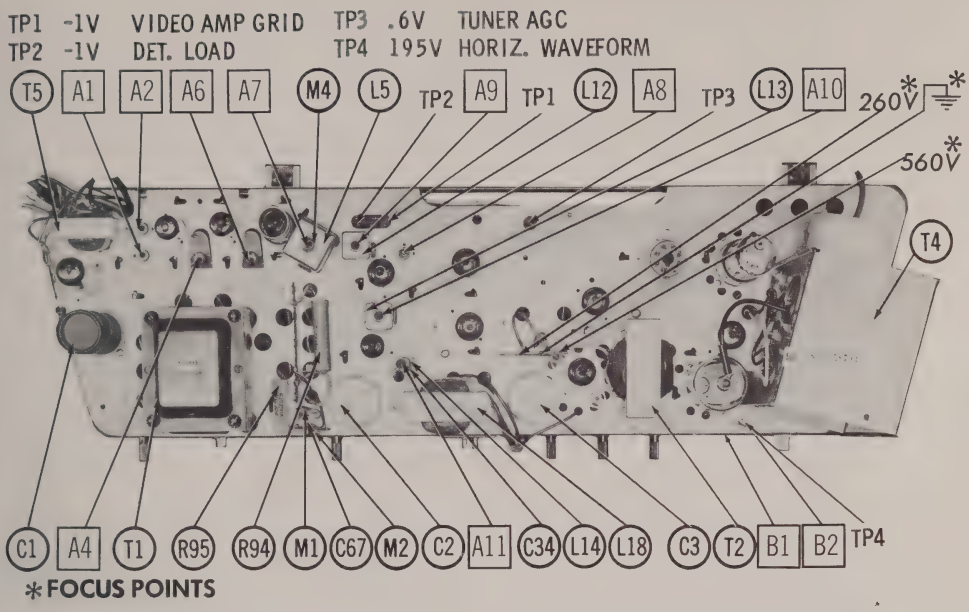
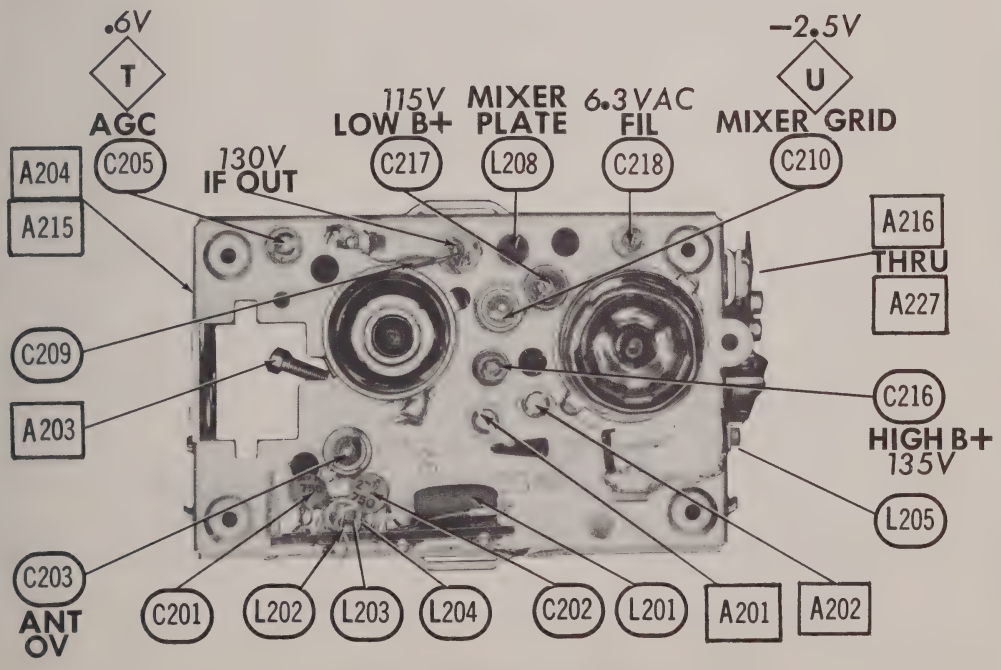


FIG. 202



TV CHASSIS - TOP VIEW



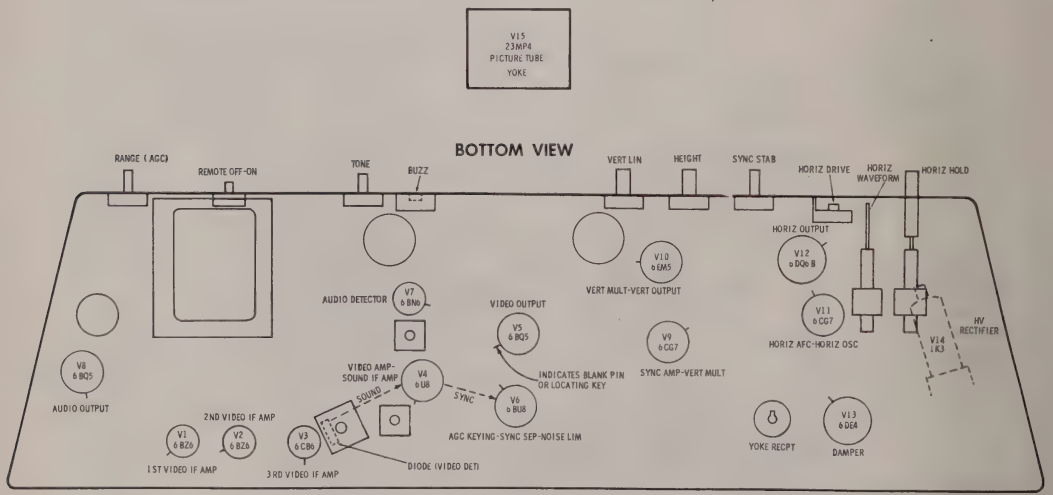
VHF TUNER - TOP VIEW

RESISTANCE MEASUREMENTS

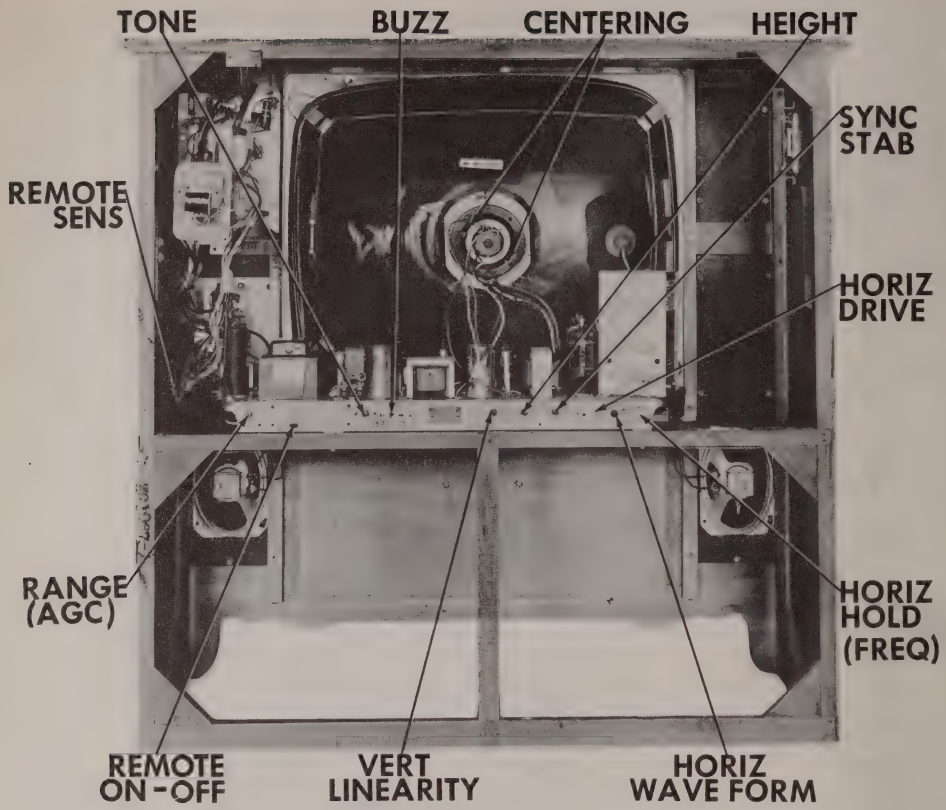
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	500K	47Ω	FIL	FIL	†3500Ω	†3500Ω	0Ω		
V2	6BZ6	450K	47Ω	FIL	FIL	†3500Ω	†3500Ω	0Ω		
V3	6CB6	.3Ω	180Ω	FIL	FIL	†3000Ω	†3000Ω	0Ω		
V4	6U8	†9000Ω	6.5Ω	†35K	FIL	FIL	†35K	2200Ω	.3Ω	3900Ω
V5	6BQ5	NC	1meg	•105Ω	FIL	FIL	NC	†3600Ω	NC	†2500Ω
V6	6BU8	†2500Ω	†6800Ω	550K	FIL	FIL	†42K	•†250K	†80K	†2.2meg
V7	6BN6	• 300Ω	3.5Ω	FIL	FIL	†7200Ω	5.7Ω	†330K		
V8	6BQ5	0Ω	NC	270Ω	FIL	FIL	NC	†1000Ω	NC	†510Ω
V9	6CG7	†12K	280K	0Ω	FIL	FIL	•†1.1meg	• 550K	0Ω	0Ω
V10	6EM5	†40Ω	TP	330K	FIL	FIL	NC	470Ω	NC	†450Ω
V11	6CG7	†56K	430K	0Ω	FIL	FIL	†40Ω	1.5meg	410K	0Ω
V12	6DQ6B	TP	FIL	TP	†12K	1meg	TP	FIL	0Ω	TOP CAP †15Ω
V13	6DE4	TP	TP	¶ 100K	NC	†40Ω	TP	FIL	FIL	
V14	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †325Ω
V15	23MP4	FIL	1meg	†10meg	†100K	NC	NC	• 300K	FIL	
V201	6ER5	0Ω	1.1meg	FIL	FIL	†8000Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†7300Ω	0Ω	FIL	FIL	†7800Ω	†2500Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1.
† MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station. Adjust the Horizontal Hold (Freq. Slug) until the picture synchronizes horizontally.

Turn the Contrast fully counterclockwise and the Brightness clockwise so that the picture appears to be washed out.

Turn the Horizontal Drive Trimmer (B1) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white vertical bar disappears.

Connect the vertical amplifier of the scope thru a low capacity probe to TP-4. Low side to chassis.

Adjust the Horizontal Waveform Slug (B2) until the round and sharp peaks of the waveform are equal in amplitude. See Fig. 4. Keep the picture in sync during this adjustment with the Horizontal Hold.

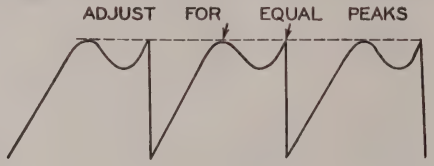


FIG. 4

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type knobs on front panel.
2. Remove 9 screws in rear cover. Remove rear cover.
3. Remove 4 chassis bolts.
4. Remove 4 screws holding control panel. Remove control panel.
5. Disconnect picture tube socket, hi voltage lead, speaker leads, yoke plug, and remote control receiver plug.
6. Pull chassis straight out.

PICTURE TUBE REMOVAL

It is necessary to remove chassis for picture tube removal.

PHOTOFACT® Folder

MOTOROLA CHASSIS QTS/RTS/STS/ TS/WTS-436, QTS/STS/TS-436Y

MOTOROLA CHASSIS QTS/RTS/STS/ TS/WTS-436, QTS/STS/STS/TS-436Y

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL A19T8CH

MOTOROLA CHASSIS QTS/RTS/STS/ TS/WTS-436, QTS/STS/STS/TS-436Y

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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DATE 1–62 SET 561 FOLDER 2

SET 561 FOLDER 2

PHOTOFACT® Folder

MOTOROLA CHASSIS QTS/RTS/STS/ TS/WTS-436, QTS/STS/TS-436Y

MOTOROLA CHASSIS QTS/RTS/STS/ TS/WTS-436, QTS/STS/TS-436Y

MODEL A19T8CH

TRADE NAME	MOTOROLA MODELS	TV Chassis	Remote Control	VHF Tuner	UHF Tuner
	19T11CH, CHA, WD	QTS-436		TT-300	
	Y19T11CH, CHA	QTS-436Y		TT-305Y	STT-601
	19T7-3A; 19T7-4A;				
	19T14CWD, CWF; 19T14WD, WF	RTS-436		TT-306	
	19T5CH, CHD; 19T12-1, -1A; 19T12-2, -2A	STS-436		TT-300	
	Y19T5CH, CHD; Y19T12-1, -1A; Y19T12-2, -2A	STS-436Y		TT-305Y	STT-601
	19T7-1, -1D; 19T-2, -2D; 19T7-3; 19T7-4;				
	19T13-1, -1A; 19T13-2, -2A;				
	19T14CW, CWA; 19T14W, WA	TS-436		TT-305	
	Y19T7-1, -1D; Y19T7-2, -2D; Y19T7-3, -4;				
	Y19T13-1, -1A; Y19T13-2, -2A;				
	Y19T14CW, CWA, W, WA	TS-436Y		TT-305Y	STT-601
	A19T8-1, -1A, -1D; A19T8-2, -2A, -2D;				
	A19T8-3, -3A; A19T8-4, -4A; A19T8CH, CHA	WTS-436	TR-10	BTT-302	

CHASSIS CODES

TV: A-00, A-01, A-02, A-03, B-00, B-01, B-02, B-03, B-04
Remote Control Receiver: A-00, A-01, B-00, B-01

MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Television Receiver (WTS-436 Chassis With Remote Control)
TUBES	TV (With VHF Tuner): Seventeen — Remote Control Receiver: Five TV (With VHF & UHF Tuner: Eighteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle
RATING	TV With Remote: 220 Watts, 2 Amp. @ 117 Volts AC (237 Watts While Tuning) TV: 195 Watts, 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

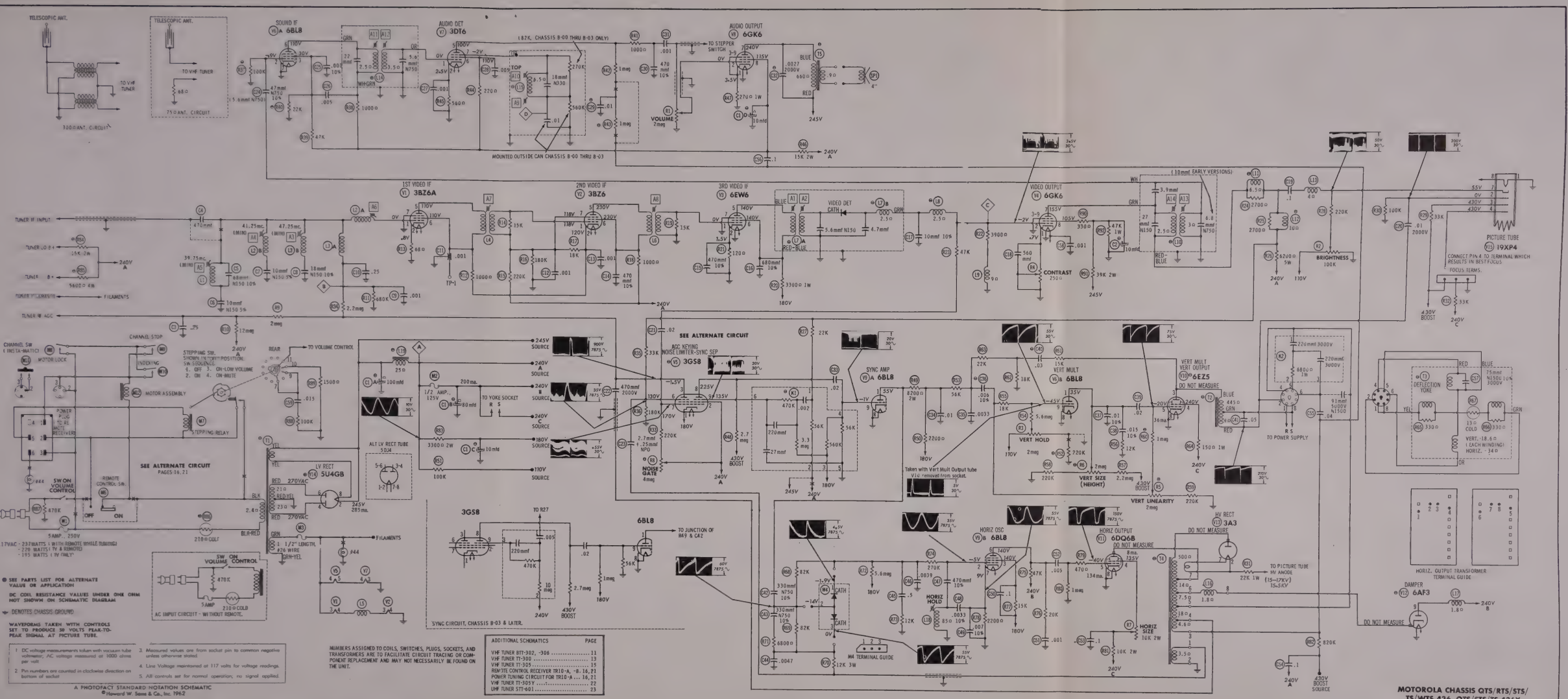
SERVICING IN THE FIELD - PAGE 3

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1962 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

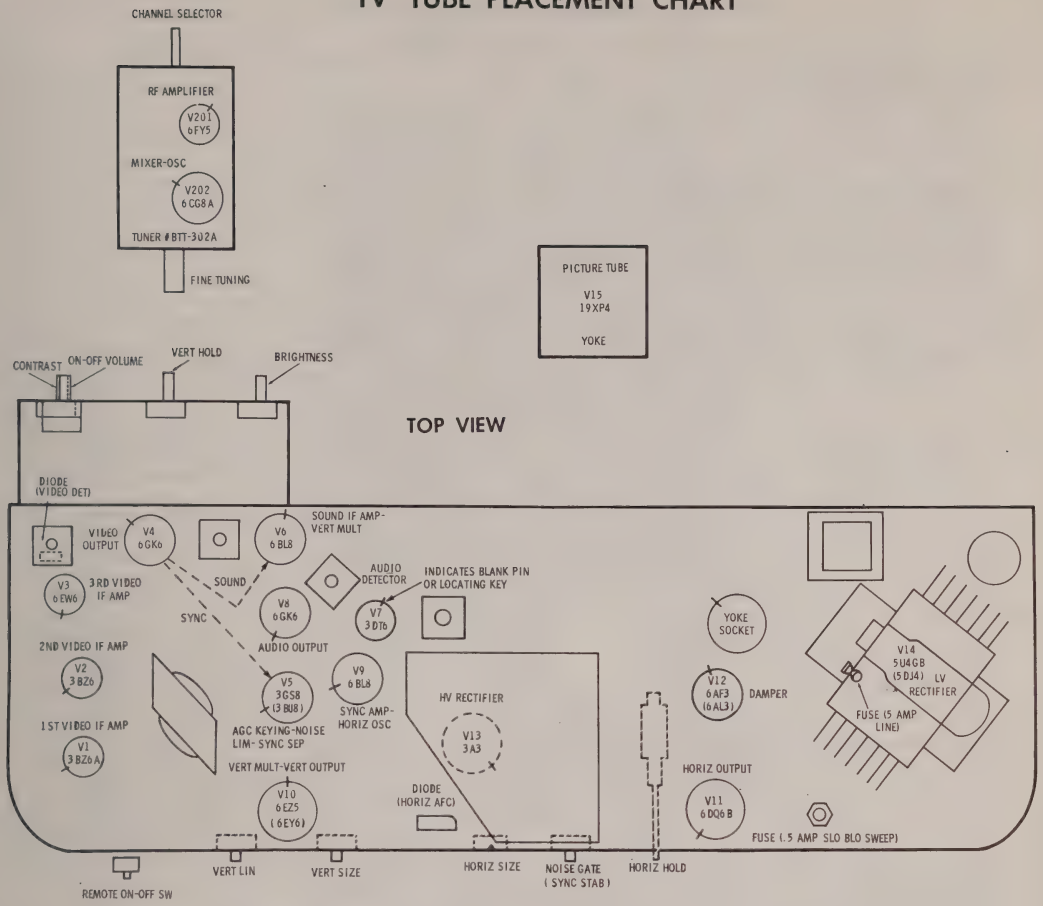
LA214

SET 561 FOLDER 2


TELESCOPIC ANT.
TO VHF TUNER
300Ω ANT. CIRCUIT
75Ω ANT. CIRCUIT
SOUND IF V6 A 6BL8
AUDIO DET V7 3DT6
AUDIO OUTPUT V8 6GK6
TO STEPPER SWITCH
VOLUME 2meg
MOUNTED OUTSIDE CAN CHASSIS B-00 THRU B-03
1ST VIDEO IF V1 3BZ6A
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 6EW6
VIDEO DET
VIDEO OUTPUT V4 6GK6
CONTRAST 250Ω
BRIGHTNESS 100K
PICTURE TUBE V13 19XP4
CONNECT PIN 4 TO TERMINAL WHICH RESULTS IN BEST FOCUS
FOCUS TERMS.
TUNER IF INPUT
TUNER LO B+
TUNER HI B+
POWER "ON" TERMINALS
FILAMENTS
TUNER RF AGC
CHANNEL SW (INSTA-MATIC)
CHANNEL STOP
MOTOR LOCK
INDEXING
MOTOR ASSEMBLY
STEPPING RELAY
STEPPING SW. SHOWN IN "OFF" POSITION. SW. SEQUENCE: 1. OFF 3. ON-LOW VOLUME 2. ON 4. ON-MUTE
POWER PLUG TO BE INSTALLED IN WHITE RECEIVER
SEE ALTERNATE CIRCUIT PAGES 16, 21
SW ON VOLUME CONTROL
REMOTE CONTROL SW.
OFF
ON
5 AMP. 250V
117VAC - 237 WATTS (WITH REMOTE WHILE TUNING) - 228 WATTS (TV & REMOTE) - 195 WATTS (TV ONLY)
TO VOLUME CONTROL
REAR
LV RECT 5U4GB
ALT LV RECT TUBE 5DJ4
TO YOKE SOCKET
SEE ALTERNATE CIRCUIT
ACC KEYING NOISE LIMITER-SYNC SEP V5 3GS8
SYNC AMP V9 A 6BL8
VERT MULT V9 B 6BL8
VERT MULT OUTPUT V10 6EZ5
DO NOT MEASURE
VERT HOLD
VERT SIZE (HEIGHT)
VERT LINEARITY
TO POWER SUPPLY
DEFLECTION YOKE
HORIZ OSC V9 B 6BL8
HORIZ OUTPUT V11 6DQ6B
HV RECT V12 3A3
TO PICTURE TUBE HV ANODE (15-17KV) 15-.5KV
HORIZ. OUTPUT TRANSFORMER TERMINAL GUIDE
DAMPER V12 6AF3
HORIZ HOLD
HORIZ SIZE
M4 TERMINAL GUIDE
TO JUNCTION OF R49 & C42
SYNC CIRCUIT, CHASSIS B-03 & LATER.
SW. ON VOLUME CONTROL
AC INPUT CIRCUIT - WITHOUT REMOTE.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
DENOTES CHASSIS GROUND
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER BTT-302, -306 11
VHF TUNER TT-300 13
VHF TUNER TT-305 15
REMOTE CONTROL RECEIVER TR10-A, -B 16, 21
POWER-TUNING CIRCUIT FOR TR10-A ... 16, 21
VHF TUNER TT-305Y 22
UHF TUNER STT-601 23
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1962
MOTOROLA CHASSIS QTS/RTS/STS/TS/WTS-436, QTS/STS/TS-436Y

TV SCHEMATIC, POWER TUNING CIRCUIT FOR REMOTE CONTROL RECEIVER TR10-B (POWER TUNING CIRCUIT FOR TR10-A, PAGES 16, 21)

TV TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (Line), V14

SWEEP FAILURE
No raster, has sound V9, V11, V12, V13, V15
No vertical deflection V6, V10
Poor vert. linearity or foldover V6, V10
Poor horiz. linearity or foldover V9, V11, V12
Narrow picture V9, V11, V12, V14
Vert. off freq. V6, V10
Horiz. off freq. Diode (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V9
No horiz. sync V5, V9
No vert. or horiz. sync V5, V9

SERVICING IN THE FIELD

FUSE

TV: A 5 Amp. fuse is used for LV power supply protection. A ½ Amp. fuse is used for horiz. & vert. sweep circuit protection. (For location, see "Tube Placement Chart".)
A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis - Bottom View".)
Remote Control Receiver: A .15 Amp. fuse is used for LV power supply protection. (See "Chassis - Top View".)

SYNC STABILITY

Sync stability may be varied by means of a Noise Gate Control. (For location, see "Tube Placement Chart".)

AGC

No provision is made to vary the AGC on this receiver.

TUNER OSCILLATOR ADJUSTMENTS

VHF Oscillator adjustments are accessible thru rear cover (next to Fine Tuning) on models with Power Tuning. On all other models, remove channel selector and finetuning knobs (also pilot lamp window mask in some versions).

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Chassis - Top View".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT IDENTIFICATION PHOTOS - PAGE 9, 27

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #9050L, 9150
WALSCO #2521

VIDEO IF ALIGNMENT

Remove the yoke plug to eliminate RF interference from the horizontal sweep circuit. Connect a 1500Ω 50 watt resistor from point Ⓐ to chassis. (CAUTION: Point Ⓐ has B plus voltage on it.)
Disable the tuner oscillator by gounding the grid (pin 9) of oscillator.
Set the Noise Gate Control fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 6 volt bias supply to point Ⓑ. Positive to chassis.
Maintain between 2 and 5 volts peak to peak on the scope except where otherwise noted in the procedure.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to 3rd Video IF Grid (V3, pin 1). Low side to chassis.	44.0MC (10MC Swp.)	45.75MC	13	Vert. Amp. thru 47K to point Ⓒ. Low side to chassis. (Across Video Detector load).	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	47.25MC	"	"	A3	Increase scope gain. Remove bias if necessary. Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
3.	"	"	"	41.25MC	"	"	A4	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil nearest chassis.
4.	"	"	"	39.75MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
5.	"	"	"	39.75MC 41.25MC 44.0MC 45.75MC 47.25MC	"	Vert. Amp. to TP-1. Low side to chassis.	Mixer Plate Coil & A6	Set scope for 3 volts peak to peak. Restore 6 volt bias. Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate Coil affects the center peak and A6 affects the two outside peaks. Tune slugs at end of coils away from chassis. If a suckout (trap effect) occurs, detune A7 to remove.
6.	"	"	"	42.25MC 45.75MC	"	Vert. Amp. thru 47K to point Ⓒ. Low side to chassis. (Across Video Detector load).	A7, A8	Adjust A7 to place 42.25MC marker at 50% on curve as in Fig. 4. Adjust A8 to place 45.75MC marker at 50% on other side. Tune slugs to end of coil nearest chassis. If necessary, retouch Mixer Plate Coil to correct tilt. Retouch A7 and A8 for correct response.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust all controls for normal picture and sound.
Connect the DC probe of a VTVM to point Ⓓ. Common to chassis. Adjust A9 for maximum deflection, choosing the one of two peaks that produces the highest voltage. While listening to the sound, retouch A9 for maximum sound with MINIMUM distortion.
The top slug A10 is a preset slug which is set near the top of the coil form and left there.
Change to a very weak signal (this may be done by loosely coupling the antenna lead to the antenna terminals) that produces a hiss in the sound. Adjust A11 and A12 for maximum sound and MINIMUM distortion. Adjust A13 for maximum undistorted sound. If sound is not clear at this point, repeat the above procedure as necessary.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Contrast fully clockwise.
Adjust the Fine Tuning until a strong 4.5MC beat pattern is visible.
Adjust A14 to find the two points at which the beat pattern is just noticeable on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.)

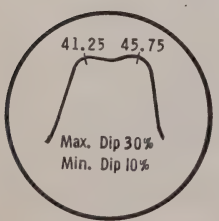


FIG.1

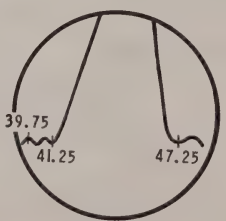


FIG.2

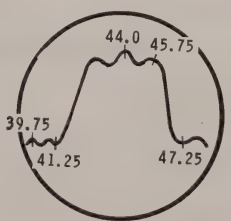


FIG.3

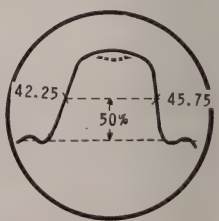
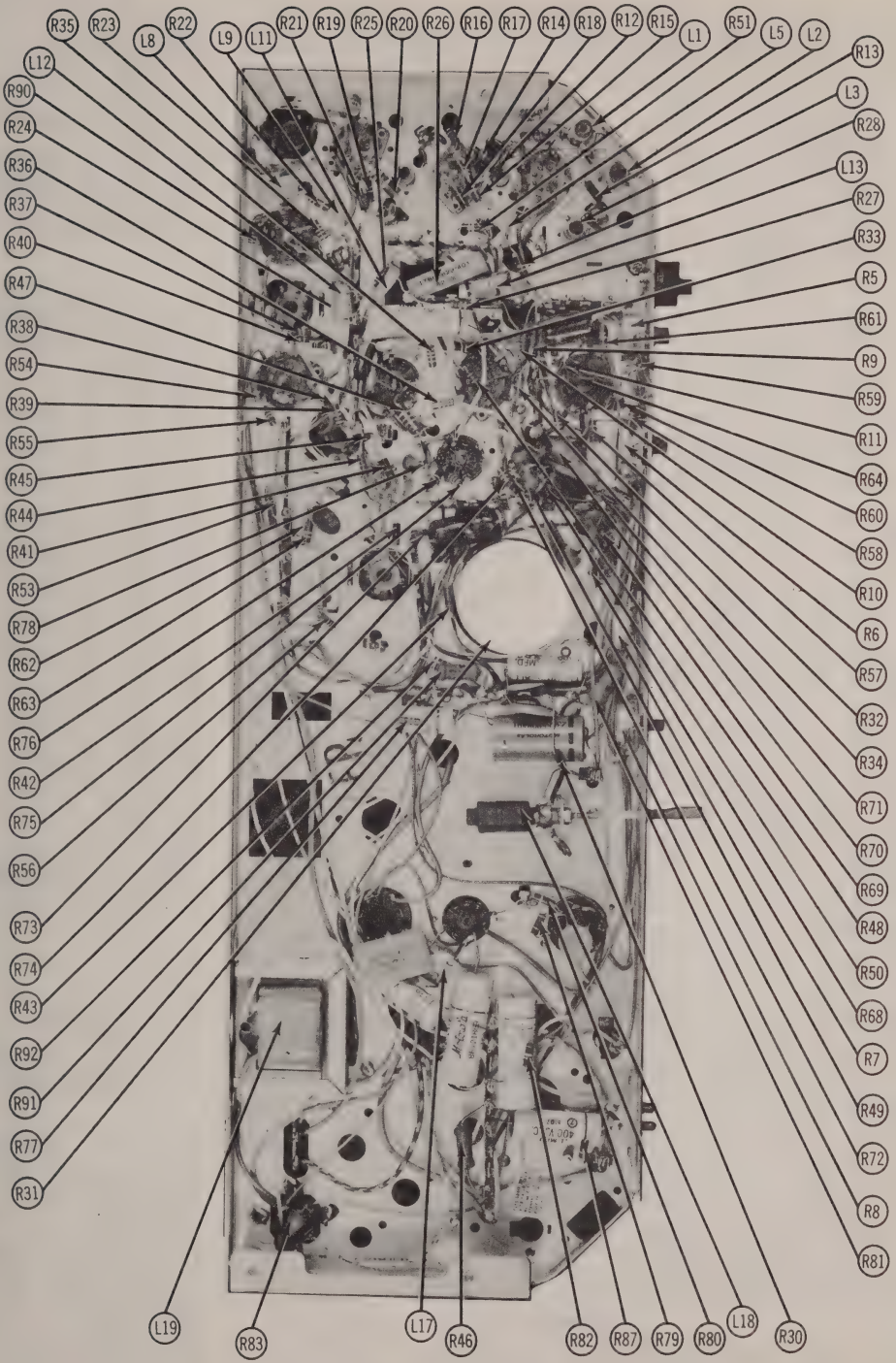


FIG.4



TV CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR IDENT.

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	GENERAL ELECTRIC • TYPE	ITEM No.	RAYTHEON • USE	RAYTHEON • TYPE	SYLVANIA • USE	SYLVANIA • TYPE
V1	1st Video IF Amp.	6BZ6	V7	Audio Detector	6DT6		
V2	2nd Video IF Amp.	3B24	V8	Audio Output	6GK6		
V3	3rd Video IF Amp.	6BW4	V9	Sync Amp. - Horiz. Osc.	6BL8		
V4	Video Output	6H6	V10	Vert. Mult. - Vert. Output	6K25 (6KY6) *		
V5	AGC Keying - Sync Sep. - Noise Limiter	3GS6 (3BU8) *	V11	Horiz. Output	6DQ6B		
V6	Sound IF Amp. - Vert. Mult.	6BL8	V12	Damper	6AF3 (6AL3) *		
			V13	HV Rectifier	3A3		
			V14	LV Rectifier	5U4GB (5U4G) *		

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V15	19XP4	19AVP4/XP4 ①	19XP4 ①		19XP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	≥100	400	23C85807A03 ①	AFH4-08-25	CO239	XC4-42	FP389.1	TMT-3805	TVL-3819
B	≥80	400			BR8045		TC80	TD-80-450	TVA-1716
C	10	400							
D	≥10	400							
C2	10	400	23C85808A01 ②	PR5T730	BR1045	QT1-5	TC72	TD-10-450	TVA-1705

① Chassis A-00 thru B-01 use 4 section: 100mfd ④ 400V, 80mfd ④ 400V, 10mfd ④ 400V, 10mfd ④ 200V (Pt. #23C85807A01). Some versions use 10mfd ④ 400V (Pt. #23C85808A01) for C1C.
② Some versions use 5mfd ④ 300V (Pt. #23C85808A03).

FIXED CAPACITORS

ITEM No.	RATING			REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.25	100V			P288N-25		CUB2P25	1DP-3-254	GEM-2025	2TM-P22
C4	470				DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C5	68	N150	10%	#21R13238				*		
C6	10	N150	5%	#21R12568				*		
C7	10	N150	5%	#21R12698				*		
C8	18	N150	10%	#21R12078				*		
C9	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	.25	50V			P288N-25		CUB2P25	1DP-3-254	GEM-2025	2TM-P10
C11	.001				EF-001	MFT-1000		CCF-102	CT280A	
C12	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	470		10%		DI-470	DD-471	5RS7T47	CCD-471	GP347	10TS-T47
C15	470		10%		DI-470	DD-471	5RS7T47	CCD-471	GP347	10TS-T47
C16	680		10%		DI-680	DD-681	5RS7T68	CCD-681	GP368	10TS-T68
C17	10		10%		NPO-SI 10	TC2Z-10	C10QSC	CCT0-100	CNO-410	10TC-Q10
C18	560				DI-560	DD-561	L10T56	CCD-561	B-356	10TS-T56
C19	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C20	.01	2000V		#21R131733					2HV-110	2TS-D10
C21	.02				BPD-02	DD-203	BYB632	CCD-203	B-120	5HK-S20
C22	470	2000V			HVD-20-470	DD30-471	HVB20T47	3CCD-471	2HV-347	10TCC-V47
C23	2.7	NPO	±.25mmf		NPO-DI 2.7		C10V3C			10TCU-Q27
C24	47	N750	10%	(5.6mmf) ①	N750-DI 47	DTN-47	C10Q47C	CCTN-470	CNT-447	10TCU-Q47
C25	.003		10%		DI-1000	DD-102	5RS1N	CCD-102	GP310	10TS-D10
C26	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C27	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C28	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C29	.01			③	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	470		10%		DI-470	DD-471	5RS7T47	CCD-471	GP347	10TS-T47
C31	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C32	.0027	2000V		(.001 or .005)②		DD30-272				
C33	.02	600V			P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C34	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	.0033				BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C36	.006	600V	10%	(.004?) ④			PMSD6	6DP-2-103	GEM-1625	6TM-D60
C37	.01	600V	10%		V84C6SL-10%		PM6S1	6DP-2-103	GEM-1611	6TM-S10
C38	.015	600V	10%		V84C6SI5-10%		PM6S15	6DP-2-153		6TM-S15
C39	.02	600V			P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-812	6TM-S20
C40	.03	600V		(.02) ⑤	P688N-03	DD-303	CUB6S3	6DP-3-303	GEM-613	6TM-S30
C41	.05	400V			P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C42	330	N750	10%		N750-DI 330	DTN-330	C10T33U	CCTN-301	CNT-333	10TCU-T33
C43	330	N750	10%		N750-DI 330	DTN-330	C10T33U	CCTN-301	CNT-333	10TCU-T33
C44	.0047				BPD-0047	DD-472	BYA10D47M	CCD-471	B-247	5HK-D47
C45	.5	100V			P288N-5		CUB2P5	1DP-4-504	GEM-205	2TM-P50
C46	.0039				DI-4000	DD-392	L10D39	CCD-392	GP239	10TS-D39
C47	470		10%		DI-470	DD-471	5RS7T47	CCD-471	GP347	10TS-T47
C48	.0033	400V	10%		V84C4D33-10%		PM6D33	6DP-1-332	JL-233	6TM-D33
C49	.007	400V	10%		V84C4D68-10%		PM6D68	6DP-1-682	GEM-1627	6TM-D68
C50	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C51	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C52	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C53	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C54	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C55	.04	400V			P488N-04	DD-403	CUB4S4	4DP-3-403	GEM-414	4TM-S40
C56	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C57	75	3000V	N1500	10%						
C58	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C59	.015				BPD-015	DD-153	BYA10S15	CCD-153	B-115	5HK-S15

① Value used in Chassis coded A-00 thru A-03.
② Used in Chassis coded A-01 and later only.
③ Alternate Values. Recommended replacement - .001 ④ 2KV.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
⑤ Value used in "A" series (below B-00).
⑥ Value used in Chassis coded A-00 thru A-03.
Motorola Part Number

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	18K747577	B-77	A47-2meg*Z	Q13-139	TA28A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R2A	100K	½	18D653216A10	B-40	B47-100K-S	B1L-128	TA15L	Brightness
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R3A	2meg	½	18D653216A11	B-75	B47-2meg-S	HLC-1	TA26L	Vert. Hold
R4A	250Ω	½	18D653216A09	B-2		B1L-301	RU2L	Contrast
B	Shaft			Not Req.		TM4	SL3500	
C	Bushing			Not Req.		Not Req.	SL38	
R5	2meg	½	18D653216A14*	TT-75	B47-2meg-S	HLC-1	PTA28L	Vert. Linearity
R6	2meg	½	18D653216A14*	TT-75	B47-2meg-S	HLC-1	PTA28L	Vert. Size (Height)
R7	10K	2(WW)	17D65820A03					Horiz. Size
R8	4meg	½	18D653216A15†	TT-86	B47-5meg-S	HLC-4	PTA56A	Noise Gate (Sync Stab.)

* Some versions may use Part #18K745523. (Same replacements as above).
† Some versions may use Part #18K746894.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R9	2meg 5%			
R10	12meg 5%			
R11	680K			
R12	1000Ω			
R13	68Ω			
R14	15K			
R15	220K			
R16	180K			
R17	18K			
R18	1000Ω			
R19	15K			
R20	3300Ω 1W			
R21	120Ω			
R22	3900Ω			
R23	47K			
R24	2700Ω			
R25	2700Ω			
R26	6200Ω 5W	PW5-6200	5W-SQ-6200	
R27	22K			
R28	220K			
R29	33K			
R30	100K			
R31	22K 1W			
R32	33K			
R33	220K			
R34	2.2meg			
R35	33K			
R36	180K			
R37	100K			(820K) ①
R38	1000Ω			
R39	47K			
R40	22K			(8200Ω) ①
R41	1000Ω			
R42	1meg		②	
R43	1meg		③	
R44	220Ω			
R45	560Ω			
R46	15K 2W			
R47	270Ω 1W			
R48	2.7meg			
R49	8200Ω 2W			
R50	2200Ω			

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R51	100K			
R52	220K			④
R53	56K			
R54	5.6meg			
R55	18K			
R56	12K			
R57	2.2meg			
R58	220K			
R59	220K			
R60	1meg			(470K) ⑤
R61	15K			
R62	10K			
R63	22K			
R64	1500Ω 1W			
R65	330Ω			
R66	330Ω			
R67	15Ω (Cold)			#6C65884A03
R68	82K			
R69	82K			
R70	12K 3W			
R71	68000Ω			
R72	5.6meg			
R73	12K			
R74	270K			
R75	47K			
R76	20K 5%			
R77	15K			
R78	2200Ω			
R79	470Ω			
R80	1meg			
R81	10K 2W			
R82	560Ω			
R83	3300Ω 2W			
R84	15K 2W			⑥
R85	56000Ω 4W	PW5-5600	5W-SQ-5600	(68000Ω 4W) ⑦
R86	2100Ω (Cold)⑧			#6C65884A02
R87	470K			
R88	100K			
R89	1500Ω			
R90	330Ω			
R91	39K 2W			
R92	47K 1W			

① Value used in Chassis coded A-00 thru A-03.
② 1meg 1 watt used in Chassis coded A-00.
③ Used in Chassis coded A-01 and later only.
④ Used in Chassis coded B-00 and later only.
⑤ Value used in Chassis coded A-00 thru A-02, A-03.
Motorola Part Number
⑥ 12K (3W) in Chassis TS, QTS, STS-436 & Y, Codes A-00 & A-01. 10K (3W) in Chassis TS, QTS, STS-436 & Y, Codes A-02 & later. Recommended replacement - 10K (3W).
⑦ Value used in TS, QTS, & STS-436 & Y.
⑧ Not used in Chassis QTS-436.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Sync Sep. - Sync Amp.Grid	27mmf, 220mmf, .002mfd, 56K, 56K, 470K, 560K, 3.3meg	51B747693	Centralab PC-358
K2	Yoke Coupling	320mmf (3000V), 320mmf (3000V), 6800Ω (1 watt)	Note 1	Sprague HN-5
			51K753327	

Note 1: Component combination (for Sync Sep. Grid, VSB) Pt. #51D653239A01 with individual components in grid circuit of Sync Amp. (V9A) used in Chassis coded A-00 thru B-02.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	39.75MC Trap	24K754048	TV-152	6235	RTC-8556	T218	① Includes Complete Ass'y. Part #V855814A53 (Ch. Coded A-00 thru A-03). ② Part #24C85828A01 (Ch. Coded A-00 thru A-03). ③ Part #24D65950A01 (Ch. Coded A-00 thru A-03). ④ Includes 2700Ω Resistor. ⑤ Part #V855241A48 (Ch. Coded B-04 and later - Recommended replace'm't Part #24D65949A01 (Ch. Coded A-00 thru A-03). ⑥ Part #V855099A99 (Ch. Coded B-04 and later - Recommended replace'm't Shunt with 2700Ω Resistor.	
L2A	1st Video IF	24K750637				T2E85		
B	41.25MC Trap							
L3A	RF Choke	24D65666A05						
B	47.25MC Trap							
L4	2nd Video IF	24K747587	TV-130	6219	RTC-8551	T217		
L5	Fil. Choke (1.5uh)	24K732774	BC-562	4604	RTC-8516	T256		
L6	3rd Video IF	24K751348	TV-130	6219	RTC-8551	T217		
L7A	4th Video IF	1V55R16A97 ①						
B	RF Choke (8.8uh)	24C85828A09 ②	BC-566	4611	RTC-8521	T260		
L8	RF Choke (8.8uh)	24C85828A09 ②	BC-566	4611	RTC-8521	T260		
L9	Peaking (390uh)	24K749673	TV-201	6134	RTC-8578	T350		
L10A	4.5MC Trap	24D65950A03 ③						
B	Sound Takeoff							
L11	Peaking (240uh)	24K752963 ④	TV-185 ▲	6181 ▲	RTC-8598 ▲	T346 ▲		
L12	Peaking (500uh)	24C85828A07 ⑤	TV-188 ▲	6174 ▲	RTC-8592 ▲	T353 ▲		
L13	Peaking (100uh)	24K750835	TV-194	6112	RTC-8574	T341		
L14	Sound IF	24D65949A02 ⑤	TV-L13	6203	RTC-8545	T235		
L15	Quadrature	24D65948A01 ⑤						
L16	RF Choke (7.5uh)	24C85828A08	BC-565	4611	RTC-8521	T521		
L17	RF Choke (7.5uh)	24C85828A08	BC-565	4611	RTC-8521	T521		

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
L18	Horiz. Stabilizer (Horiz. Hold)	24C85853A01	TV-165	6319	RTC-8529	HS-7		T111	

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L19	.270A	25Ω	.7 Hy.	25C85808A01A ①	C-4084	C-2343		C-38X	① Alternate Part #25C85808A01

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	RATING: SEC. 4	RATING: SEC. 5	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ② 1.7A	540VCT ② .285A DC	5V ④ 3A	6.3V ③ 8.2A			25D65683A02-L ①					① Alternate Part #25D65683A02

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	Vert. Output	25D65840A01-D		VO-106 ①	26823 ①	A-144X	
T3	Alt. Vert. Output	25D65840A01					
	Yoke (Horiz. 18MEI) (114°) (Vert. 31MEI)	24D65816A06-H ②		DY-46A ③④	Y-53 ④⑤⑥	Y-62-1 ⑥ ⑦	
	Alt. Yoke	24D65816A08					
	Rear Cover and Centering Device	59K754392					
	Yoke Clamp	42A742819					
T4	Horiz. Output	24D65410A05-H					
	Alt. Horiz. Output	24D65410A05					
	Pri. & Sec. Coil only (For T4)	24D65958A01					

① Drill new mounting hole(s).
② Less rear cover and centering device.
③ Connect Yoke Terminal #3 to Yoke Plug Pin #4; Yoke Terminals #2 & #7 to Yoke Plug Pin #5; Yoke Terminal #1 to Yoke Plug Pin #6; Yoke Terminal #4 to Yoke Plug Pin #8; Yoke Terminal #6 to Yoke Plug Pin #2; Connect jumper across yoke plug pins #1 & 3.
④ Use original Yoke Damping Network if necessary.
⑤ Remove 27mmf Capacitor across Yoke Terminals #2 & #7.
⑥ Connect Yoke #1 to Plug Pin #4; Yoke Terminals #4 & #3 to Yoke Plug Pin #5; Yoke Terminal #7 to Yoke Plug Pin #6; Yoke Terminal #6 to Yoke Plug Pin #2; Yoke Terminal #4 to Yoke Plug Pin #8; Connect jumper across yoke plug pins #1 & 8.
⑦ Use original damping resistors if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	14K	8-8Ω	25K754420A01 ①	A-2900 ②	A-3856 ②	24304 ②	S-52X ②	① Alternate Part #25K754420 ② Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	4"	PM	6-8Ω	50K751421	4AIZ8	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	5A 250V	65A742613	31A737466	312005	357001	MTH5	4405
M2	N	1/2A 125V B/B	65K751794	9K750675	233.500 (N 1/2A 125V B/B)	346009	N 1/2	HN 1/2 - 3/4
M3	1 1/2"	length of #26 wire						

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	NOTES
M4		48C85831A03	6GC1		Dual Selenium, Horiz. AFC, Common Cathode

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5	Tuner (BTT-302)	27D65990A01-B (27D65990A03)	VHF, Used in Chassis WTS-436 STANDARD COIL REPLACEMENT #GG-4230A
	Tuner (TT-300)	27D65852A01	VHF, Used in Chassis TS-436, QTS-436
	Tuner (TT-305)	27D65852A04	VHF, Used in Chassis TS-436
	Tuner (TT-306)	27D65081A01	VHF, Used in Chassis TS-436
	Tuner (TT-305Y)	27D65852A05	VHF with UHF Provisions, Used in Ch. STS-436Y, TS-436Y, QTS-436Y
	Tuner (STT-501)		UHF, Used in Chassis STS-436Y, TS-436Y, & QTS-436Y
M6	Switch	40K754389	Remote-Manual (DPDT Slide Type)

TV PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS (cont)

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M7	Relay	80C85738A01	AC Stepping, Includes Audio Level, Mute, Wafer Switch #1C85754A01, Off-On Switch #40C85836A01
M8	Switch	1D85489A02	Motor Lock (On Motor)
M9	Switch	1C85995A01	Channel Stop (On Front Tuner Bracket)
M10	Switch	1P85118A04	Indexing (On Rear of Tuner)
M11	Switch	40C85521A02	Channel Change
M12	Motor Assembly	1D85989A01	Includes Gear Box, Motor Lock Switch (#1D85489A02)
	Antenna	1B742795	JFD REPLACEMENT #TA-379, Used in all models except those with suffix letter "A" or "F" in the model number
	Antenna	1C86120A01	JFD REPLACEMENT #TA-415, Used in all models with suffix letters "A" or "F" in the model number

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

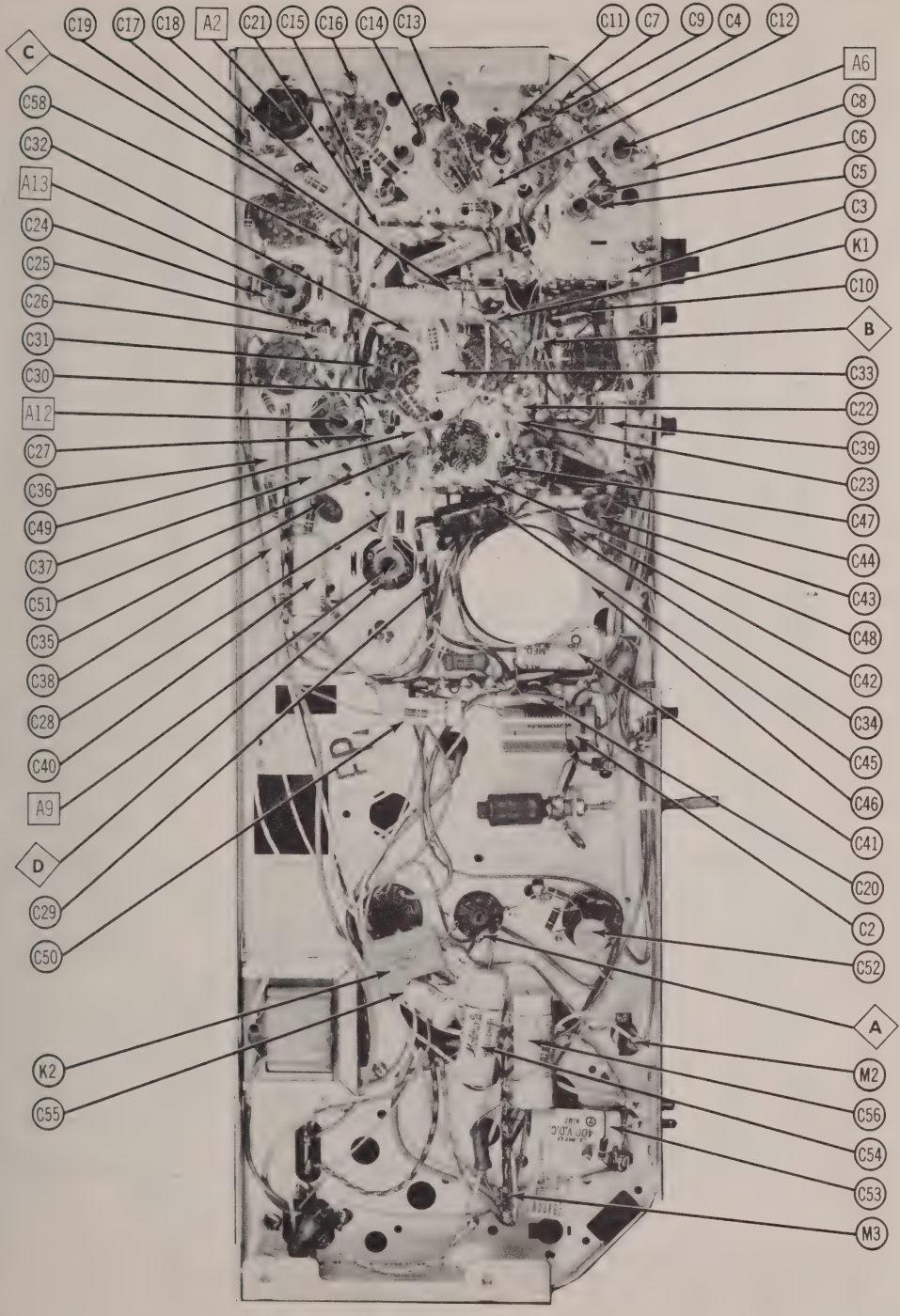
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODELS A19T8 Series	19T5 Series	Y19T5 Series	19T7 Series	Y19T7 Series	19T11 Series	Y19T11 Series	19T12 Series	Y19T12 Series	19T13 Series	Y19T13 Series	19T14 Series	Y19T14 Series
Safety Glass (Tinted)	61C65692A01	X	X	X	X	X	X	X	X	X	X	X	X	X
Indicator Window (VHF)	36C65874A01				X	X					X	X	X	X
Indicator Window (VHF)	36C66024A01	X												
Dial-UHF Channel Indicator	34C65710A01			X		X		X		X		X		X
Knob-UHF Channel Selector	36D65708A01			X		X		X		X		X		X
Knob-VHF Channel Selector	36D65709A01		X	X					X	X				
Knob- "	36D65875A01				X	X					X	X	X	X
Knob- "	36D65709A03						X	X						
Knob- "	36D65994A01	X												
Pushbar-VHF Channel Sel.	38C66005A01	X												
Knob-Fine Tune	36C65712A01		X	X					X	X				
Knob- "	36C65871A01				X	X					X	X	X	X
Knob- "	36C66021A01	X												
Knob- "	36C65712A02						X	X						
Knob-On-Off-Volume	36C65711A01	X	X	X	X	X			X	X	X	X	X	X
Knob- "	36C65711A02						X	X						
Knob-Contrast, V. Hold, Brt.	36C65713A01	X	X	X	X	X			X	X	X	X	X	X
Knob- "	36C65713A02						X	X						
Handle-Carrying	55C65631A15		X	X			X	X						
Handle- "	55C65631A21	MODELS 19T12-1, -1A, & Y												
Handle- "	55C65631A23	MODELS 19T12-2, -2A & Y												
Handle- "	55C65631A17	MODELS 19T13-1, -1A & Y												
Handle- "	55C65631A19	MODELS 19T13-2, -2A & Y												

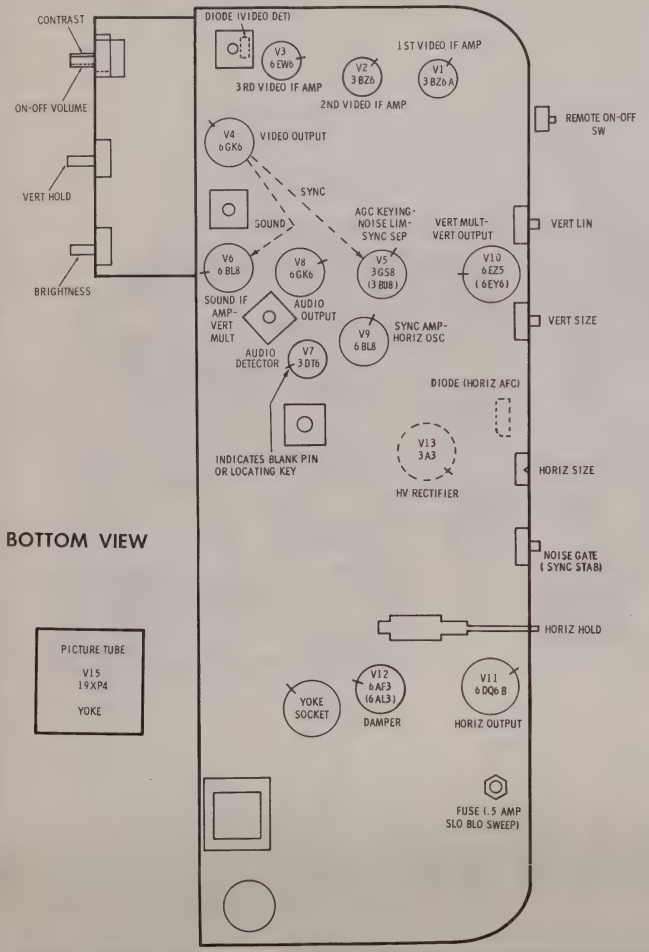
MODEL NO.	CABINET PART NO.
A19T8-1	16F65717A05
A19T8-1A	16F65717A25
A19T8-1D	16F65717A25
A19T8-2	16F65717A15
A19T8-2A	16F65717A26
A19T8-2D	16F65717A26
A19T8-3	16F65717A16
A19T8-3A	16F65717A16
A19T8-4	16F65717A17
A19T8-4A	16F65717A17
A19T8CH	16F65717A31
A19T8CHA	16F65717A31
19T5CH	16F65717A01
Y19T5CH	16F65717A01
19T5CHD	16F65717A27
Y19T5CHD	16F65717A29
19T7-1	16F65717A07
Y19T7-1	16F65717A08
19T7-1D	16F65717A21
Y19T7-1D	16F65717A22
19T7-2	16F65717A09
Y19T7-2	16F65717A10
19T7-2D	16F65717A23
Y19T7-2D	16F65717A24
19T7-3	16F65717A11
Y19T7-3	16F65717A12
19T7-4	16F65717A13
Y19T7-4	16F65717A14
19T7-3A	16F65717A11
19T7-4A	16F65717A13
19T11CH	16F65717A27
Y19T11CH	16F65717A29

MODEL NO.	CABINET PART NO.
19T11CHA	16F65717A27
Y19T11CHA	16F65717A29
19T11WD	16F65717A13
19T12-1	16F65717A32
Y19T12-1	16F65717A33
19T12-1A	16F65717A32
Y19T12-1A	16F65717A33
19T12-2	16F65717A34
Y19T12-2	16F65717A35
19T12-2A	16F65717A34
Y19T12-2A	16F65717A35
19T13-1	16F65717A21
Y19T13-1	16F65717A22
19T13-1A	16F65717A21
Y19T13-1A	16F65717A22
19T13-2	16F65717A23
Y19T13-2	16F65717A24
19T13-2A	16F65717A23
Y19T13-2A	16F65717A24
19T14CW	16F65717A11
Y19T14CW	16F65717A12
19T14CWA	16F65717A11
Y19T14CWA	16F65717A12
19T14W	16F65717A13
Y19T14W	16F65717A14
19T14WA	16F65717A13
Y19T14WA	16F65717A14
19T14CWD	16F65717A11
19T14CWF	16F65717A11
19T14WD	16F65717A13
19T14WF	16F65717A13



TV CHASSIS BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.

TV TUBE PLACEMENT CHART

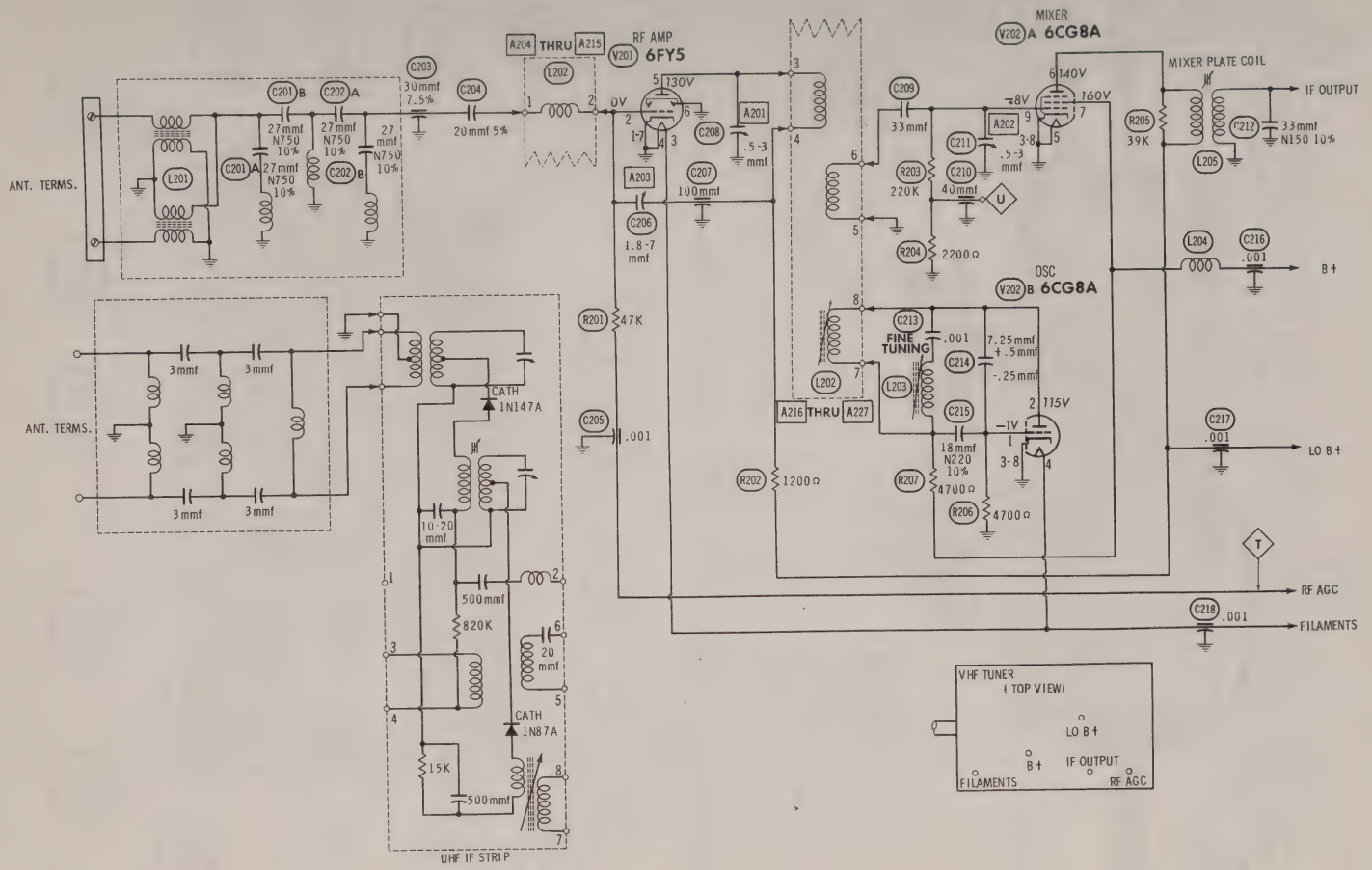


BOTTOM VIEW

TV RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6A	680K	68Ω	FIL	FIL	■1000Ω	■1000Ω	0Ω		
V2	3BZ6	100K	120K	FIL	FIL	†1000Ω	†1000Ω	100K		
V3	6EW6	.1Ω	120Ω	FIL	FIL	†6600Ω	†6600Ω	0Ω		
V4	6GK6	●60Ω	3900Ω	0Ω	FIL	FIL	NC	†6200Ω	†30K	NC
V5	3GS8	†3300Ω	†25Ω	2meg	FIL	FIL	†39K	●† 1meg	†3.5meg	† 3.8meg
V6	6BL8	†4.8meg	100K	†30K	FIL	FIL	†16K	0Ω	0Ω	● 1.8meg
V7	3DT6	3.5Ω	560Ω	FIL	FIL	†2meg	†15K	560K		
V8	6GK6	270Ω	●100K	270Ω	FIL	FIL	NC	†660Ω	†15K	NC
V9	6BL8	†13K	450K	†18K	FIL	FIL	†47K	2200Ω	0Ω	†70K
V10	6EZ5	NC	FIL	†470Ω	†175Ω	●2meg	TP	FIL	0Ω	
V11	6DQ6B	TP	FIL	NC	●†12K	1meg	TP	FIL	0Ω	TOP CAP †15Ω
V12	6AF3	NC	NC	NC	FIL	FIL	TP	TP	NC	†25Ω TOP CAP 5.4meg
V13	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †515Ω
V14	5U4GB	TP	¶ INF	NC	23Ω	NC	21Ω	TP	¶ INF	
V15	19XP4	FIL	100K	†850K	†820K	NC	NC	● 250K	FIL	
V201	6FY5	0Ω	3.5meg	FIL	FIL	†6800Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†20K	0Ω	FIL	FIL	†5600Ω	†15K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 2 OF V14.
† MEASURED FROM CAP OF V12.
■ MEASURED FROM PIN 2 OF V2.
NC NO CONNECTION
TP TIE POINT



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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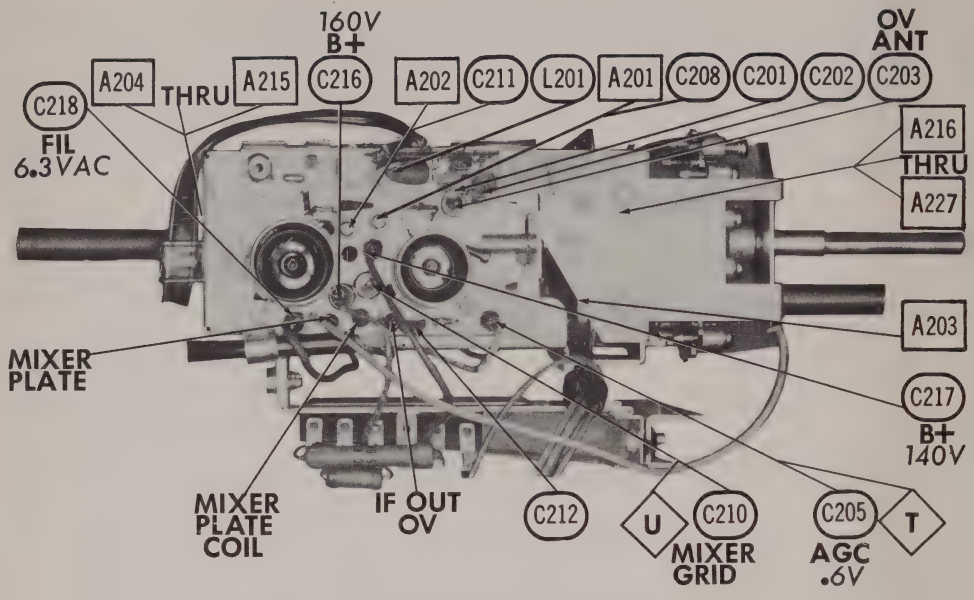
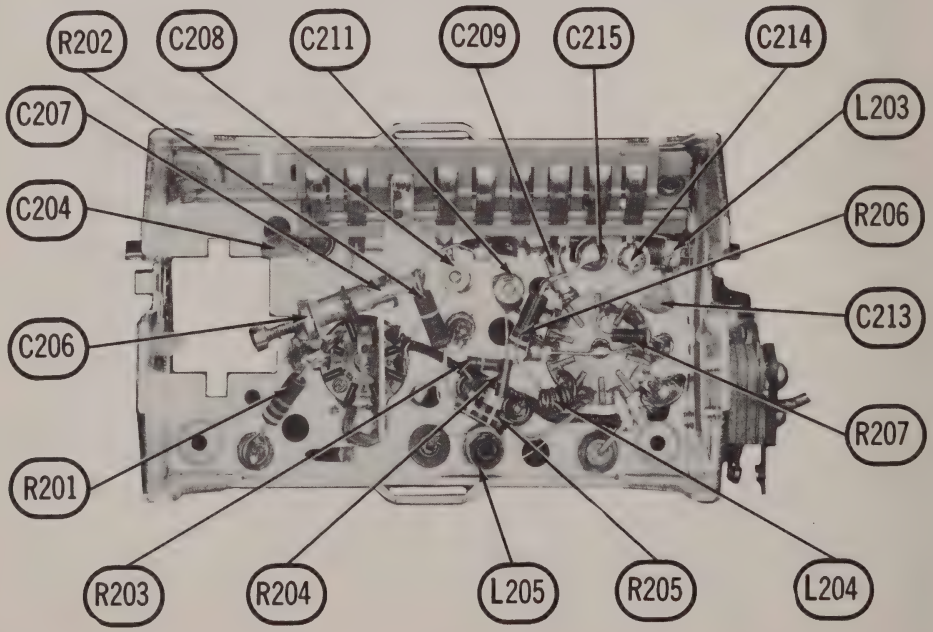
VHF TUNER BTT-302, -306

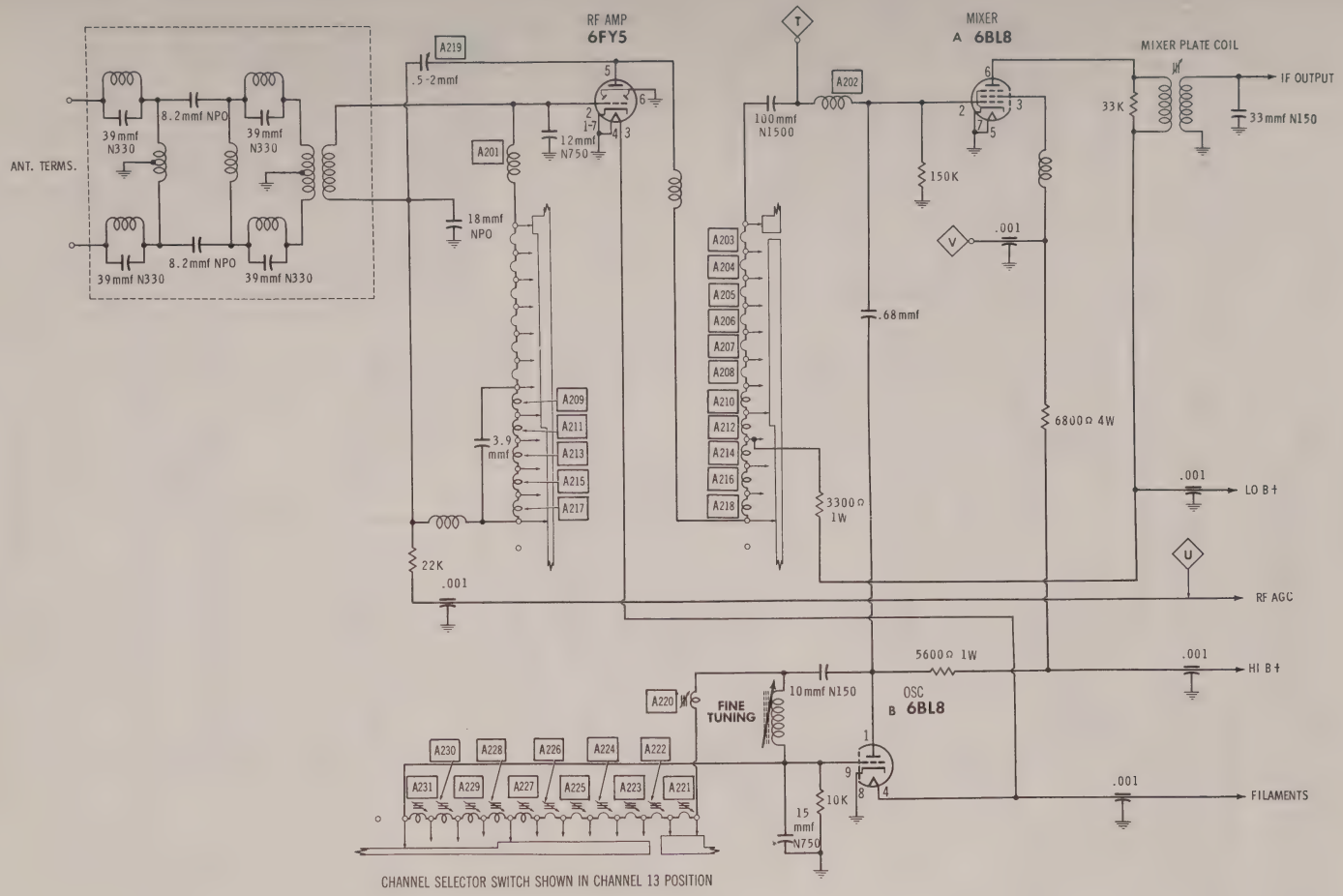
MOTOROLA CHASSIS GTS/RTS/STS/
TS/WTS-436, GTS/STS/TS-436Y



VHF TUNER BTT-302 - TOP VIEW



VHF TUNER BTT-302 - BOTTOM VIEW



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VHF TUNER TT-300

MOTOROLA CHASSIS GTS/RTS/STS/
TS/WTS-436, GTS/STS/TS-436Y

FOLDER 2

VHF TUNER ALIGNMENT INSTRUCTIONS
TT–305, –305Y

PRE-ALIGNMENT INSTRUCTIONS

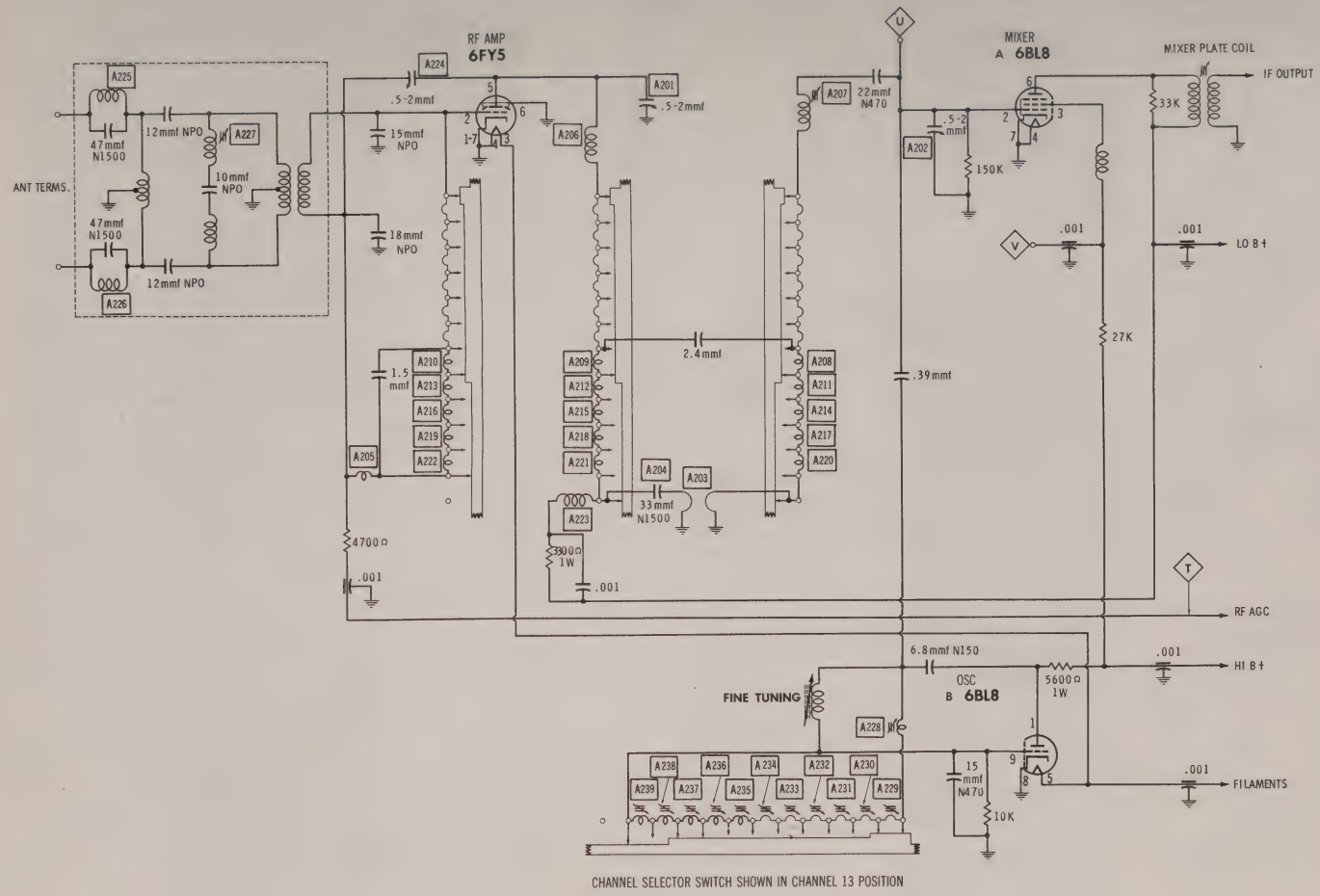
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Before proceeding with alignment, measure Oscillator to Mixer Grid injection voltage at point Ⓤ with a VTVM.
It should measure approximately -3 to -4 volts.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 150Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓥ. Low side to chassis.	A201, A202	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2.	"	"	"	"	"	A203, A204	Adjust (with respect to each other) for proper bandwidth as in Fig. 201.
3.	"	"	"	"	"	A205	Adjust for maximum amplitude and MINIMUM tilt.
4.	"	177MC	175.25MC 179.75MC	7	"	A201, A202	Retouch for proper marker position as in Fig. 202.
5.	"	213MC	211.25MC 215.75MC	13	"	A206	If necessary, adjust for proper marker placement as in Fig. 201.
6.	"	"	"	"	"	A207	Adjust for proper marker placement and tilt as in Fig. 201. Repeat steps 1 thru 6. If the proper response curve cannot be obtained, perform step 13, then repeat steps 1 thru 6.
7.	"	85MC	83.25MC 87.75MC	6	"	A208, A209, A210	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
8.	"	79MC	77.25MC 81.75MC	5	"	A211, A212, A213	"
9.	"	69MC	67.25MC 71.75MC	4	"	A214, A215, A216	"
10.	"	63MC	61.25MC 65.75MC	3	"	A217, A218, A219	"
11.	"	57MC	55.25MC 59.75MC	2	"	A220, A221, A222	"
12.	"	"	"	"	"	A223	Adjust to sharpen the slope of response curve adjacent to Video marker and to a point where the Video marker just begins to fall into the skirt of response curve. Check on channel 3 and if necessary, make compromise.
13.	"	201MC	199.25MC 203.75MC	"	"	A224	Increase bias at point Ⓣ until the RF Amplifier is cut off, then increase generator output until some response can be seen on the scope. Adjust A224 for zero or MINIMUM response on scope. Remove the bias from point Ⓣ. If the RF Amplifier breaks into oscillation, back off A224 until oscillation stops. NOTE: An excessive tilt of the response curve that increases slowly when the bias is removed indicates oscillation. Recheck steps 1 thru 12.
14.	"	44MC	45.5MC	2	Across Video Detector load thru 10K	A225 A226	Set generator output as high as possible. Detune A227 without removing core. Adjust A225 and A226 for MINIMUM response at 45.5MC marker.
15.	"	"	43.5MC	"	"	A227	Adjust for MINIMUM response at 43.5MC marker. Increase generator output and decrease bias, then readjust A225, A226 and A227 for MINIMUM response. Repeat as necessary.

CONTINUED PAGE 23



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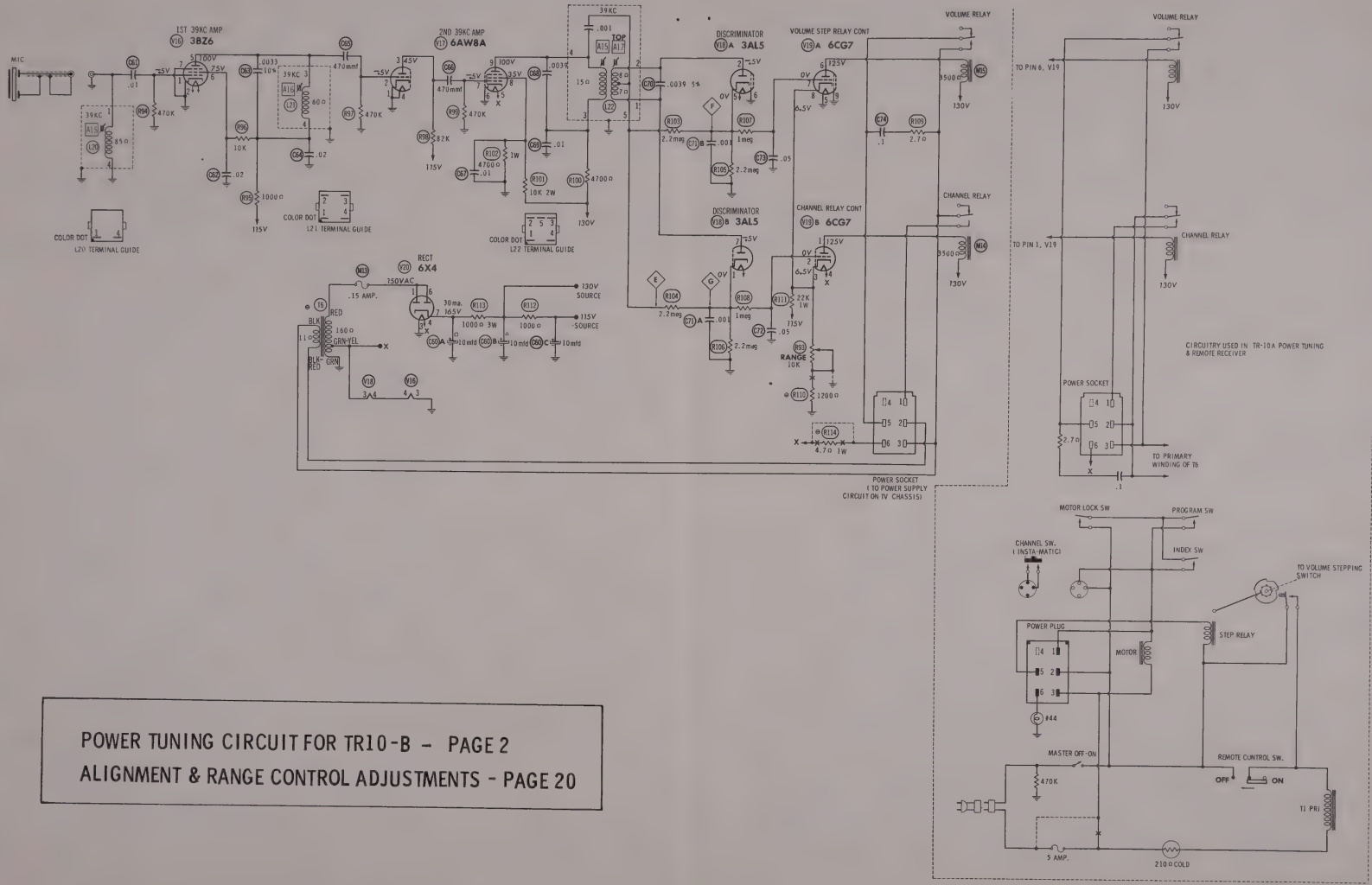
VHF TUNER TT-305

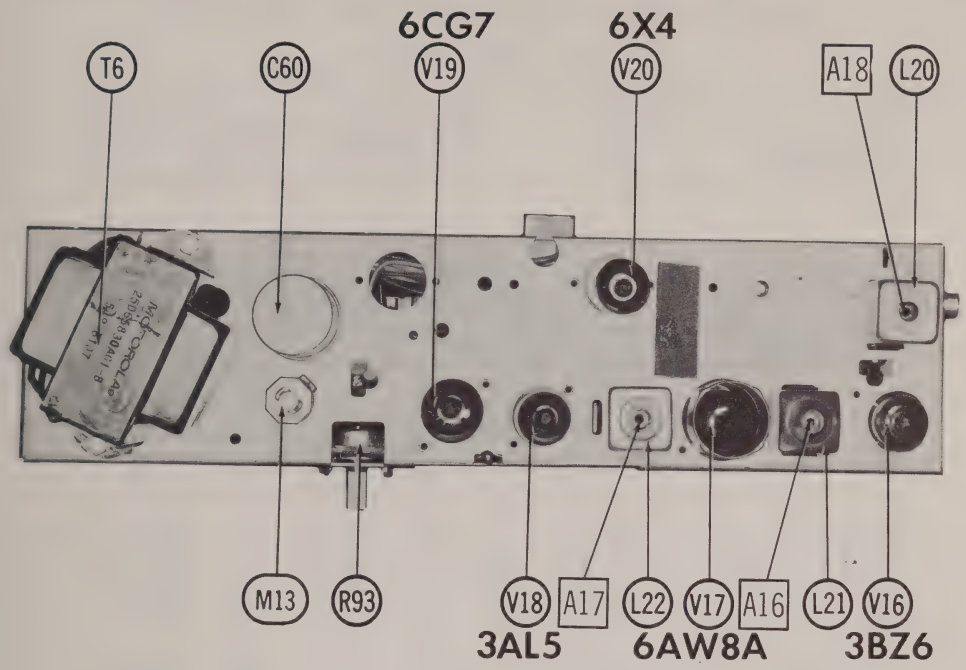
MOTOROLA CHASSIS GTS/RTS/STS/
TS/WTS-436, GTS/STS/TS-436Y

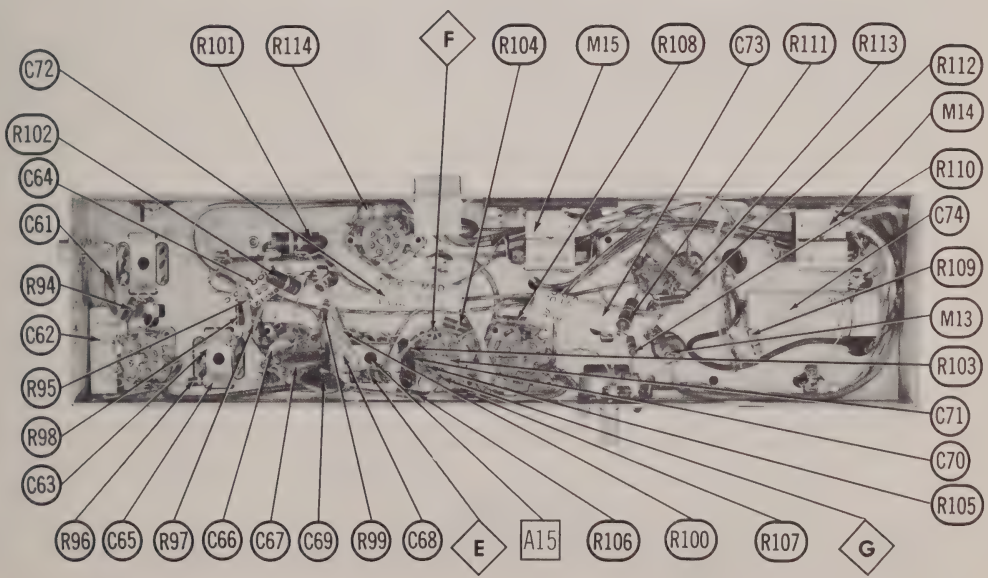


POWER TUNING CIRCUIT FOR TR10-B - PAGE 2

ALIGNMENT & RANGE CONTROL ADJUSTMENTS - PAGE 20

REMOTE CONTROL RECEIVER TR10-A, -B - POWER TUNING CIRCUIT TR10-A





REMOTE CONTROL RECEIVER TR10-B

SET 561 FOLDER 2

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TR10—A,—B

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V16	1st 39KC Amp.	3BZ6	V19	Channel Selector - Volume Relay Control	6CG7
V17	2nd 39KC Amp.	6AW8A	V20	Rectifier	6X4
V18	Discriminator	3AL5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C60A	■ 10	200	23K753669	AFH3-22	C0210	XC3-7	FP330.5	TMT-3292	TVL-3580
B	▲ 10	200							
C	10	200							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C61	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C62	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S20
C63	.0033 10%		DI-3300		1R5D33	CCD-332	JL-233	10TS-D33
C64	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S20
C65	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C66	470		DI-470	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C67	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C68	.0039 400V		P684CM-0039	D6-402	DPMS6D39	6DP-1-392	GP239	6PS-D39
C69	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C70	.0039 5%		1464-0039		1R5D39	CM-20B-392J	MCJ462.5	MS-239
C71A	.001		BPD-2X001	DD3-102	BYD6DD1	CCD-102	B2X210	5HK-2D10
B	.001					CCD-102		
C72	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C73	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C74	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-103	GEM-601	6TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R93A	10K	½	18D65216A07	TT-14	B47-10K-S	B11-116	TA14L	Range
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R94	470K			
R95	1000Ω			
R96	10K			
R97	470K			
R98	82K			
R99	470K			
R100	4700Ω			
R101	10K 2W			
R102	4700Ω 1W			
R103	2.2meg			
R104	2.2meg			

Note 1. Used in Chassis coded A-01 and later only.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R105	2.2meg			
R106	2.2meg			
R107	1meg			
R108	1meg			
R109	2.7Ω			
R110	1200Ω			Note 1
R111	22K 1W			
R112	1000Ω			
R113	1000Ω 3W	PW3-1000	3G-1000	
R114	4.7Ω 1W			Note 2

Note 2. Used in Chassis coded B-00 and later only.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L20	Input	24K752483					
L21	39KC IF	24C745791				TB654	
L22	Discriminator	24C750085				TE286	

REMOTE CONTROL RECEIVER
PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	117V @ .29A	150V @ .030A Tap @ 6.3V @ 2.3A	25D65830A01B ①					① Alternate Part #25D65830A01

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M13	N	.15A 125V S/B	65K749181	9K743152	313.150 (N 15/100 125V S/B)	346008	N 15/100	HNO - 3/10

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M14	Relay	80K753598	Channel Change, Momentary Type
M15	Relay	80K753598	Volume Stepping Relay Actuator, Momentary Type
	Microphone	50C66208A01	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

REMOTE CONTROL TRANSMITTER
PARTS LIST AND DESCRIPTIONS

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
	Transmitter	1V65811A40	Complete
	Tuning Rod	47B748542	Transducer (38.5KC Channel Sel.)
	Tuning Rod	47K52165	Transducer (39.5KC Volume)
	Spring	41A65061A01	Pushbutton
	Lever Assembly	1D65273A04	Includes Sound Activator Stud (Channel Sel.)
	Lever Assembly	1D65273A02	Includes Sound Activator Stud (Volume)
	Cover	15D65271A01	Plastic, Black
	Housing	15D65272A03	
	Pushbutton	38B65058A01	

ALIGNMENT INSTRUCTIONS

TR10—A,—B

REMOTE CONTROL RECEIVER ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CONNECT VTVM	ADJUST	REMARKS
1.	Across microphone receptacle.	39KC	DC probe thru 100K to point Ⓔ. Common to chassis.	A15, A16	Adjust for maximum deflection. Reduce signal input to provide no more than -60 volts DC on VTVM.
2.	"	"	DC probe to point Ⓕ. Common to point Ⓖ.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	Use a properly aligned transmitter or a signal source.	Alternately depress the two buttons	DC probe thru 100K to point Ⓔ. Common to chassis.	A18	While alternately depressing the two buttons. Adjust A18 for maximum and balanced deflection.

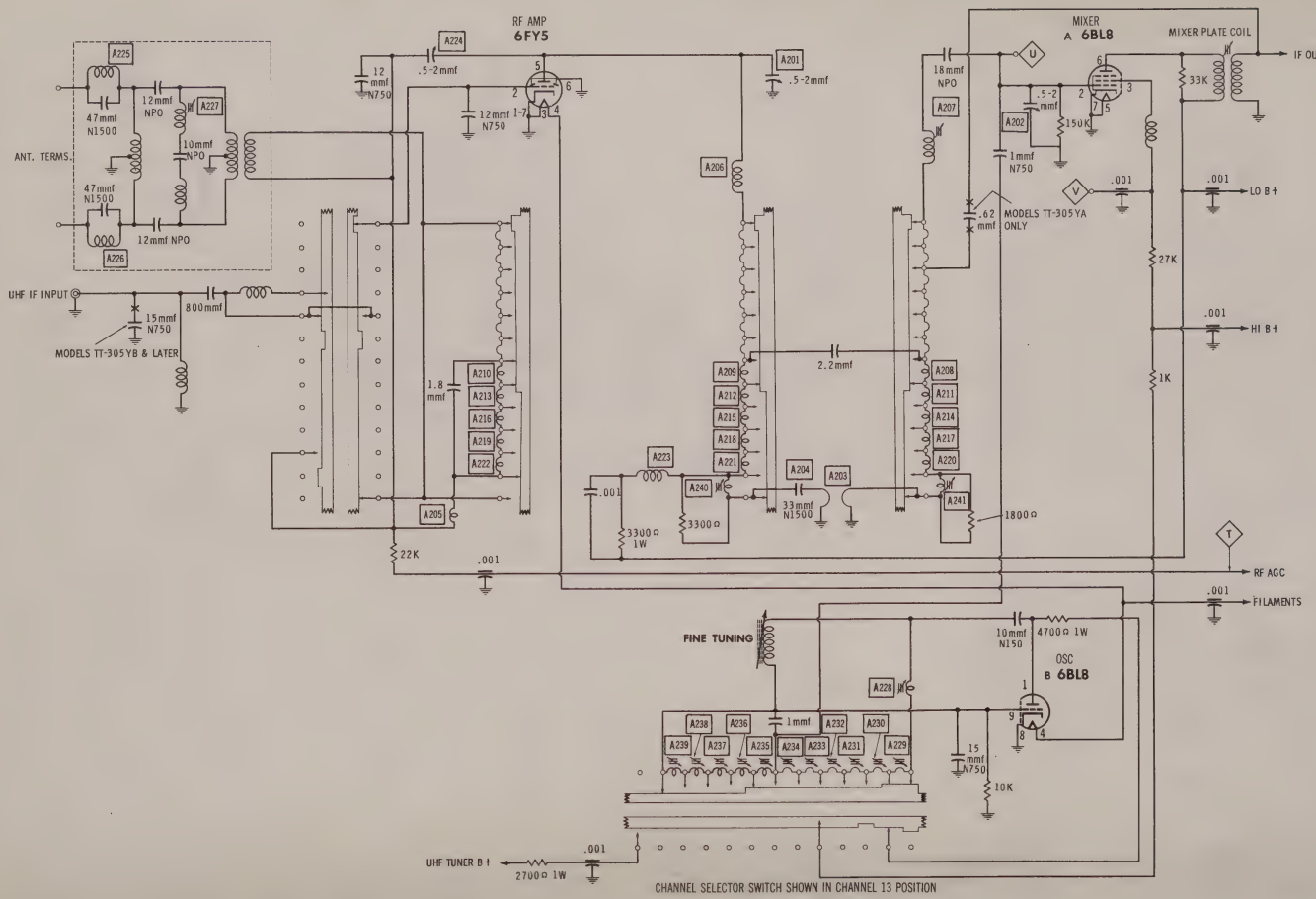
REMOTE CONTROL RANGE ADJUSTMENT

Set Remote Range Control to center of its range. Move to the normal viewing area of the room and operate the Remote Control Transmitter. If the functions operate properly, leave control at this setting. If not, turn control clockwise until all functions operate satisfactorily from the viewing area.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V16	3BZ6	470K	0Ω	FIL	FIL	††3000Ω	††13K	0Ω		
V17	6AW8A	0Ω	470K	††84K	FIL	FIL	0Ω	470K	††10K	††5700Ω
V18	3AL5	1.8meg	2.2meg	FIL	FIL	1.8meg	0Ω	2.2meg		
V19	6CG7	††4500Ω	2.8meg	1300Ω	FIL	FIL	††4500Ω	2.8meg	1300Ω	NC
V20	6X4	160Ω	NC	FIL	FIL	NC	160Ω	¶ 10K		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 7 OF V20. NC NO CONNECTION



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VHF TUNER TT-305Y

VHF TUNER TT-305,-305Y ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Across antenna terminals with 150Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A228	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A229	
		201MC	199.25MC 203.75MC	11		A230	
		195MC	193.25MC 197.75MC	10		A231	
		189MC	187.25MC 191.75MC	9		A232	
		183MC	181.25MC 185.75MC	8		A233	SEE FIG. 203 BELOW
		177MC	175.25MC 179.75MC	7		A234	
		85MC	83.25MC 87.75MC	6		A235	
		79MC	77.25MC 81.75MC	5		A236	
		69MC	67.25MC 71.75MC	4		A237	
		63MC	61.25MC 65.75MC	3		A238	
		57MC	55.25MC 59.75MC	2		A239	

GEN. IMPEDANCE	R1	R2
50Ω	25Ω	NONE
75Ω	NONE	NONE
150Ω	100Ω	75Ω
300Ω	240Ω	75Ω

UHF IF ALIGNMENT (TT-305Y)

Short point Ⓘ to chassis. Do not remove tuner shield.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Across UHF Input receptacle of VHF tuner thru network in Fig. 203.	44MC	41.25MC 45.75MC	UHF	Vert. Amp. thru 47K to point Ⓥ. Low side to chassis.	A240, A241	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.

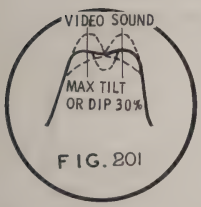


FIG. 201

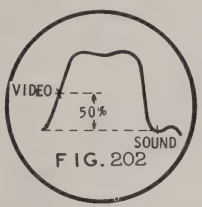


FIG. 202

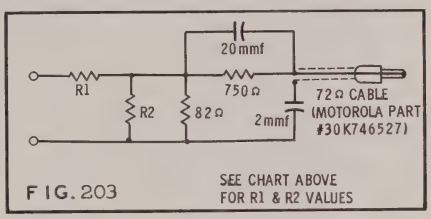
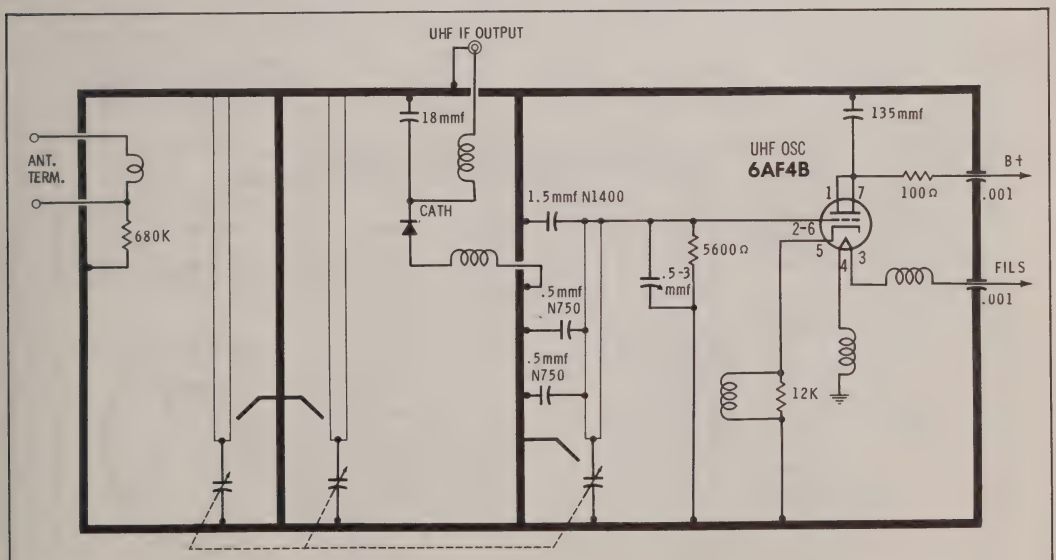


FIG. 203 SEE CHART ABOVE FOR R1 & R2 VALUES

FIG. 204



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UHF TUNER STT-601

VHF TUNER ALIGNMENT INSTRUCTIONS

TT–300

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect DC probe of VTVM to point Ⓣ. Common to chassis.
Voltage should be approximately –4 volts. If voltage is excessively high or low, correct by replacing Mixer-Osc. tube if necessary.
Short point Ⓤ to chassis.
Do not remove tuner shield; make adjustment of coils thru holes provided.
Maintain 1.0 volts peak to peak on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across VHF antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓥ. Low side to chassis.	A201, A202	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. If proper response cannot be obtained, perform step 4, then continue alignment.
2.	"	207MC	205.25MC 209.75MC	12	"	A203	If necessary, adjust for maximum gain and symmetry of response with markers as shown. Adjust by moving coil towards or away from wafer.
		201MC	199.25MC 203.75MC	11		A204	
		195MC	193.25MC 197.75MC	10		A205	
		189MC	187.25MC 191.75MC	9		A206	
		183MC	181.25MC 185.75MC	8		A207	
		177MC	175.25MC 179.75MC	7		A208	
3.	"	85MC	83.25MC 87.75MC	6	"	A209, A210	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
		79MC	77.25MC 81.75MC	5		A211, A212	
		69MC	67.25MC 71.75MC	4		A213, A214	
		63MC	61.25MC 65.75MC	3		A215, A216	
		57MC	55.25MC 59.75MC	2		A217, A218	
4.		201MC	199.25MC 203.75MC	11	"	A219	Connect negative side of a variable bias supply to point Ⓤ. Positive side to chassis. Increase bias voltage until RF Amplifier is cut off, then increase generator output until some response can be seen on scope. Adjust A219 for zero or MINIMUM response on scope. Remove bias from point Ⓤ. If RF Amplifier breaks into oscillation, back-off on A219 until oscillation stops. Recheck steps 1, 2 and 3.

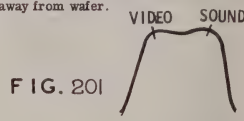


FIG. 201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use 10MC sweep unless otherwise noted.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A220	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A221	
		201MC	199.25MC 203.75MC	11		A222	
		195MC	193.25MC 197.75MC	10		A223	
		189MC	187.25MC 191.75MC	9		A224	
		183MC	181.25MC 185.75MC	8		A225	
		177MC	175.25MC 179.75MC	7		A226	
		85MC	83.25MC 87.75MC	6		A227	
		79MC	77.25MC 81.75MC	5		A228	
		69MC	67.25MC 71.75MC	4		A229	
		63MC	61.25MC 65.75MC	3		A230	
		57MC	55.25MC 59.75MC	2		A231	

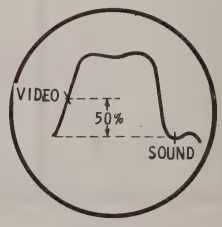


FIG. 202

VHF TUNER ALIGNMENT INSTRUCTIONS

BTT-302, -306

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 .....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A204 thru A215 ..... None Required

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Use 10MC sweep unless otherwise noted.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (U). Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A205	
		201MC	199.25MC 203.75MC	11		A206	
		195MC	193.25MC 197.75MC	10		A207	
		189MC	187.25MC 191.75MC	9		A208	
		183MC	181.25MC 185.75MC	8		A209	
		177MC	175.25MC 179.75MC	7		A210	
		85MC	83.25MC 87.75MC	6		A211	
		79MC	77.25MC 81.75MC	5		A212	
		69MC	67.25MC 71.75MC	4		A213	
		63MC	61.25MC 65.75MC	3		A214	
		57MC	55.25MC 59.75MC	2		A215	

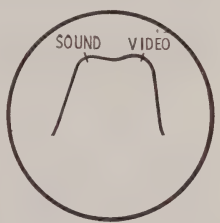


FIG.201

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A217	
		201MC	199.25MC 203.75MC	11		A218	
		195MC	193.25MC 197.75MC	10		A219	
		189MC	187.25MC 191.75MC	9		A220	
		183MC	181.25MC 185.75MC	8		A221	
		177MC	175.25MC 179.75MC	7		A222	
		85MC	83.25MC 87.75MC	6		A223	
		79MC	77.25MC 81.75MC	5		A224	
		69MC	67.25MC 71.75MC	4		A225	
		63MC	61.25MC 65.75MC	3		A226	
		57MC	55.25MC 59.75MC	2		A227	

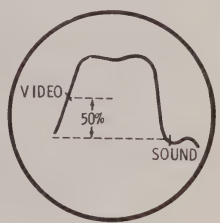


FIG.202

VHF TUNER PARTS LIST AND DESCRIPTIONS

BTT–302,–306

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6FY5	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201A	27 N750 10%		N750-DI 15	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
B	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C202A	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
B	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C203	30 7.5%	#21P65119A06						
C204	20 5%			DTZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C205	.001		EF-001	MFT-1000		CCF-102	CT280A	
C206	1.8-7	#1P65119A09		829-7				
C207	100		EF-0001	MFT-100				
C208	.5-3			829-3		CV-1	CT565	
C209	33		NPO-SI 33	TCZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C210	40	#21P65119A11						
C211	.5-3			829-3		CV-1	CT565	
C212	33 N150 10%					*		10TCP-Q33
C213	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C214	7.25 +.5-.25mmf	#21P65119A16						
C215	18 N220 10%	#21P65119A14				*		10TCR-Q18
C216	.001		EF-001	MFT-1000		CCF-102	CT280A	
C217	.001		EF-001	MFT-1000		CCF-102	CT280A	
C218	.001		EF-001	MFT-1000		CCF-102	CT280A	

Motorola Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

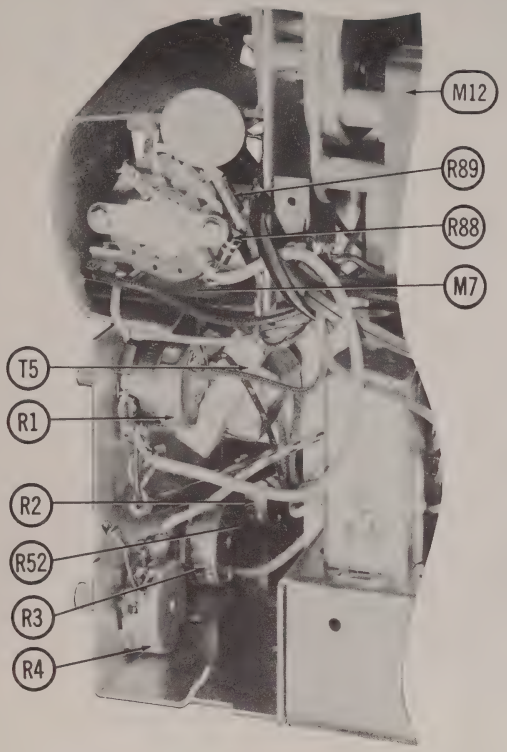
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	47K				R205	39K			
R202	1200Ω				R206	4700Ω			
R203	220K				R207	4700Ω			
R204	2200Ω								

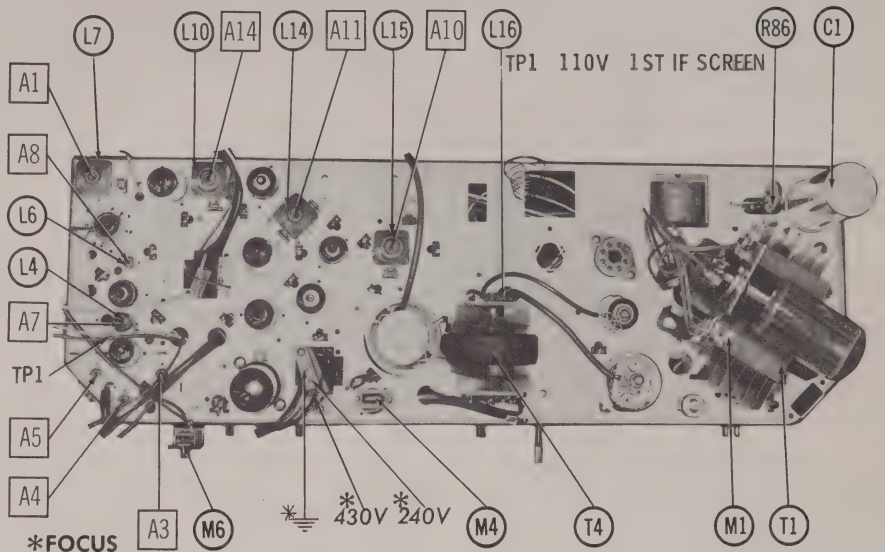
COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	Ant.	1P65119A17	Complete Ass'y
L202A	Ant., RF, Mixer & Osc.	1D66142A02	Channel 2
B	"	1D66142A03	Channel 3
C	"	1D66142A04	Channel 4
D	"	1D66142A05	Channel 5
E	"	1D66142A06	Channel 6
F	"	1D66142A07	Channel 7
G	"	1D66142A08	Channel 8

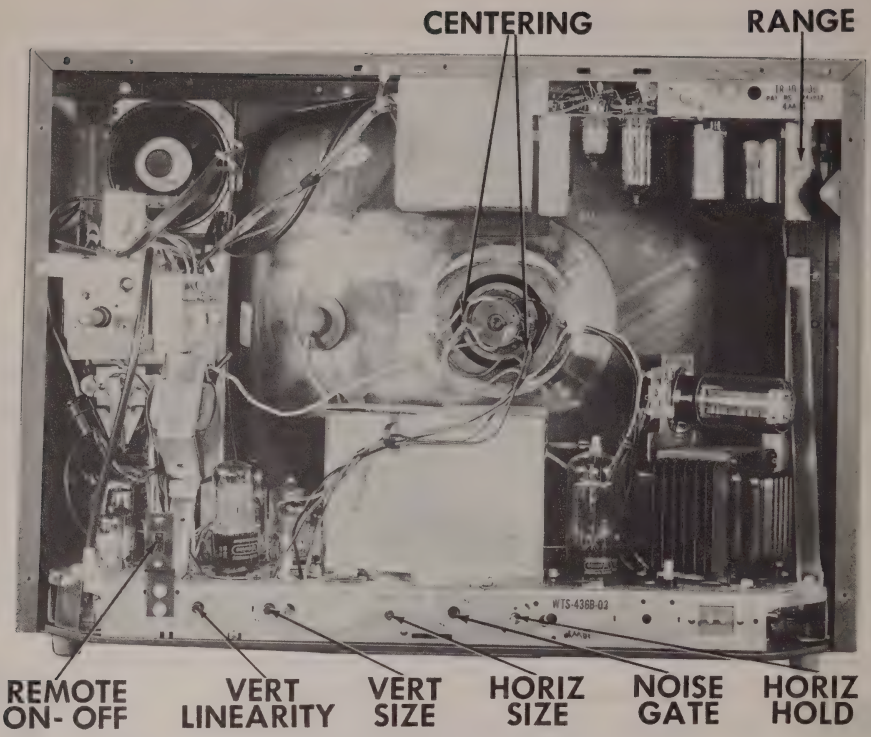
ITEM No.	USE	MOTOROLA PART No.	NOTES
L202H	Ant., RF, Mixer & Osc.	1D66142A09	Channel 9
J	"	1D66142A10	Channel 10
K	"	1D66142A11	Channel 11
L	"	1D66142A12	Channel 12
M	"	1D66142A13	Channel 13
L203	Fine Tuning	24P65119A22	
L204	RF Choke	24P65119A21	
L205	Mixer Plate	24P65119A23	



TV CHASSIS CONTROL PANEL



TV CHASSIS - TOP VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast for a normal picture.

Turn the Horizontal Hold (Freq. Slug) clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

WIDTH

The width may be varied by a Horizontal Size Control.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Adjust Horizontal Size for a picture slightly wider than necessary to fill picture mask horizontally.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold.

DISASSEMBLY INSTRUCTIONS

CHASSIS AND PICTURE TUBE ASSEMBLY REMOVAL (MODELS WITH REMOTE CONTROL)

1. Remove 4 push-on type knobs and channel selector knob from front.
2. Remove rear cover (7 screws).
3. Remove 4 chassis bolts from bottom.
4. Remove remote control chassis (3 screws, disconnect microphone cable and power plug).
5. Remove 3 bracket holding screws (2 at top, 1 on left side) from rear of chassis and unplug wire from channel selector bar.
6. Disconnect speaker wires and remove chassis and picture tube assembly.

PICTURE TUBE REMOVAL

It is necessary to remove chassis for picture tube removal.

CHASSIS REMOVAL (MODELS WITHOUT REMOTE CONTROL)

1. Remove channel selector and control knobs.
2. Remove rear cover.
3. Remove screws in mounting braces(top rear) and 1 screw from VHF Tuner brace (left rear).
4. On UHF Models, remove UHF Tuner (1 screw in mounting bracket, inside at top of cabinet) and move tuner to rear of cabinet.
5. Remove chassis.

SAFETY GLASS REMOVAL

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

PHOTOFACT® Folder

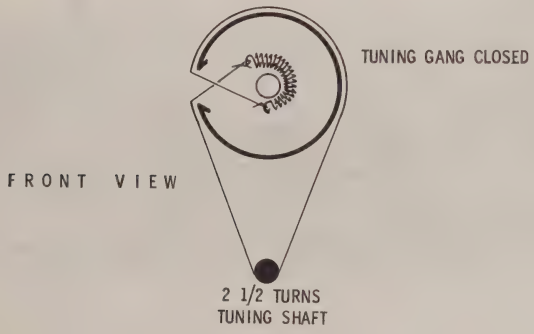
**ADMIRAL MODEL
Y3083 (Ch. 5V5)**

ADMIRAL MODEL
Y3083 (Ch. 5V5)

ADMIRAL MODEL
Y3083 (Ch. 5V5)

TRADE NAME	Admiral Model Y3083 (Ch. 5V5)
MANUFACTURER	Admiral Sales Corp., National Service Div., 903 Morrissey Drive, P.O. Box 845, Bloomington, Illinois
TYPE SET	AC-DC Operated 5 Tube FM Receiver
POWER SUPPLY	110 – 120 Volts AC-DC RATING 27 Watts, .27 Amp. @117 Volts AC
TUNING RANGE—FREQ. MOD.	88 – 108MC

DRIVE CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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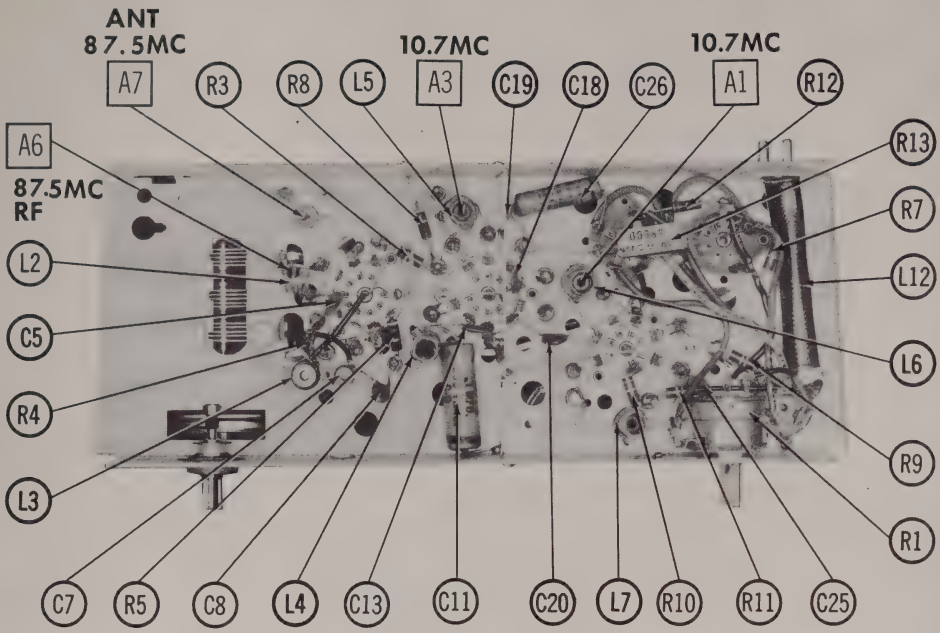
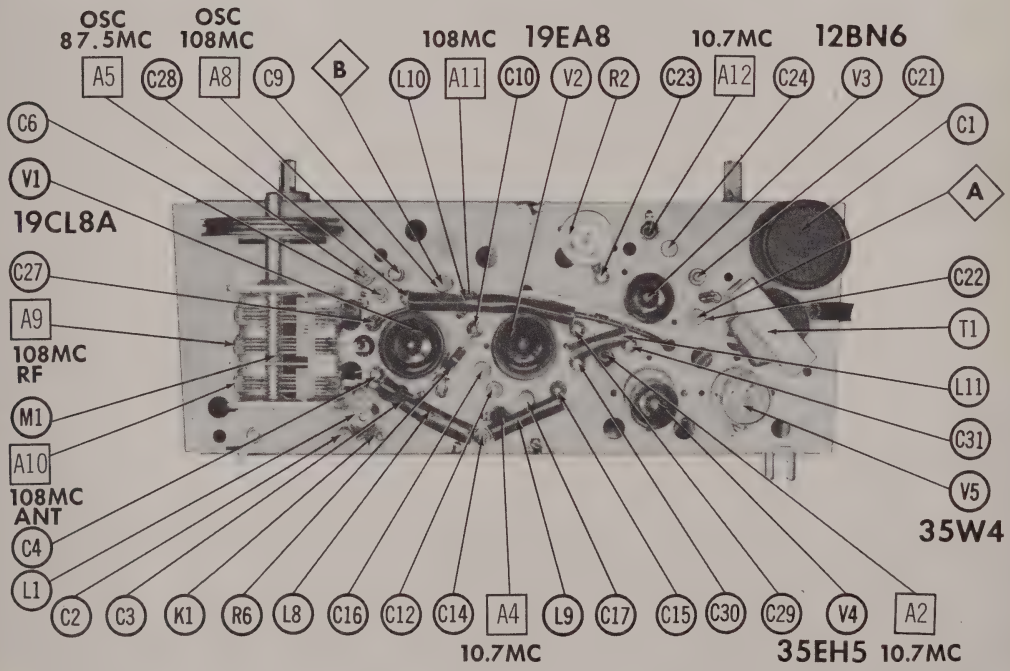
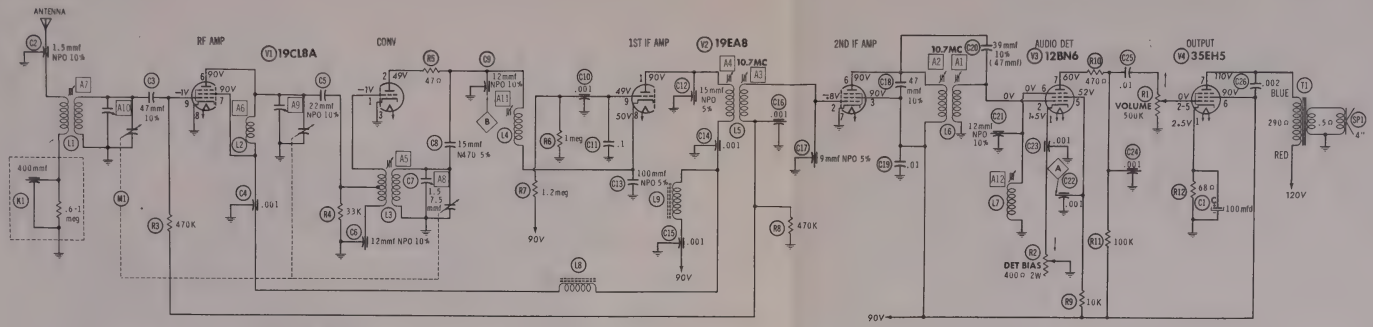
KI900



CHASSIS BOTTOM VIEW



CHASSIS TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	19CL8A	33K	∞47Ω	0Ω	30Ω	50Ω	†1000Ω	†1000Ω	0Ω	940K
V2	19EA8	†1000Ω	470K	†1000Ω	18Ω	30Ω	†1000Ω	0Ω	INF	250K
V3	12BN6	320Ω	.1Ω	10Ω	0Ω	†11K	.1Ω	†100K		
V4	35EH5	68Ω	NC	95Ω	50Ω	0Ω	†1000Ω	†290Ω		
V5	35W4	TP	NC	95Ω	142Ω	142Ω	140Ω	¶ INF		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. NC NO CONNECTION
■ MEASURED FROM PIN 8 OF V2. TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ADMIRAL MODEL Y3083 (Ch. 5V5)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Short point Ⓐ to chassis.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns. A2 may not be used.
Suggested Alignment Tools:
A1, A2, A3, A4, A11, A12... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A7..... GENERAL CEMENT #8721, 8722
WALSCO #2519
A8, A9, A10..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .001mfd to point Ⓑ. Low side to chassis.	10.7MC (400~ 30% AM)	Point of non-interference.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru 75Ω to antenna lead. Low side to chassis.	87.5MC	Tuning gang fully closed.	"	A5, A6, A7	"
3.	"	108MC	108MC	"	A8, A9, A10, A11	"
4.	"	87.5MC	Tuning gang fully closed.	"		Retouch A5 for maximum output.
5.	"	108MC	108MC	"		Retouch A8, A9 and A10 for maximum output.
6.	High side thru .001mfd to point Ⓑ. Low side to chassis.	10.7MC	Point of non-interference.	"	A12, R2	Remove clip lead from point Ⓐ. Adjust A12 for maximum output. Starting from fully clockwise, adjust R2 to the first point of maximum output.

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	RF Amplifier-Conv.	19CL8A
V2	1st IF Amplifier-2nd IF Amplifier	19EA8
V3	Audio Detector	12BN6
V4	Output	35EH5
V5	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	60	150	67A57-1	AFH2-17	XB0165	XC2-30	FP216,6	TMD-2120	TVL-2435
B	60	150		PRS1100	NLW100-6	MT1-18	TT6X100	ML100-3	TE-1059.5
C	100	3							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1.5 NPO 10%	#65A71-1						
C3	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C4	.001		EF-001	MFT-1000		CCF-102	CT280A	
C5	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C6	12 NPO 10%	#65A73-1						
C7	1.5-7.5	#65B74-1		829-7				
C8	15 N470 5%	#65D10-124				*		
C9	12 NPO 10%	#65A73-1						
C10	.001		EF-001	MFT-1000		CCF-102	CT280A	
C11	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C12	15 NPO 5%	#65A73-2						
C13	100 NPO 5%			DTZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
C14	.001		EF-001	MFT-1000		CCF-102	CT280A	
C15	.001		EF-001	MFT-1000		CCF-102	CT280A	
C16	.001		EF-001	MFT-1000		CCF-102	CT280A	
C17	9 NPO 5%	#65A73-3						
C18	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C19	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	39 10%	(47) †	DI-39	DD-390	L10C39	CCD-390	GP439	10TS-Q39
C21	12 NPO 10%	#65A73-1						
C22	.001		EF-001	MFT-1000		CCF-102	CT280A	
C23	.001		EF-001	MFT-1000		CCF-102	CT280A	
C24	.001		EF-001	MFT-1000		CCF-102	CT280A	
C25	.01		BPD-001	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C27	.001		EF-001	MFT-1000		CCF-102	CT280A	
C28	.001		EF-001	MFT-1000		CCF-102	CT280A	
C29	.001		EF-001	MFT-1000		CCF-102	CT280A	
C30	.001		EF-001	MFT-1000		CCF-102	CT280A	
C31	.001		EF-001	MFT-1000		CCF-102	CT280A	

Admiral Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Alternate Value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	75B78-1	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2	400Ω	2(WW)	75A79-1			110-600	PFL-600	Detector Bias

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	470K			
R4	33K			
R5	47Ω			
R6	1meg			
R7	1.2meg			
R8	470K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R9	10K			
R10	470Ω			
R11	100K			
R12	68Ω			
R13	1000Ω 3W	PW3-1000	3W-SQ-1000	Pt. #61A-38-1

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA
K1	Antenna Iso.	400 mmf, .6-1meg	63B16-1	Centralab RC-471 Sprague AC1-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	Ant.	72B230-1					
L2	RF	73D20-73					
L3	Osc.	72B231-1					
L4	1st IF	72B229-1					
L5	2nd IF	72B229-2					
L6	3rd IF	72B229-3					
L7	Quadrature	72B229-1					
L8	RF Choke(2.8uh)	73B51-1	SW-630	4606	RTC-8517	T857	
L9	RF Choke(2.8uh)	73B51-2	SW-630	4606	RTC-8517	T857	
L10	Fil. Choke(2.8uh)	73B51-3	SW-630	4606	RTC-8517	T857	
L11	Fil. Choke(2.8uh)	73B51-4	SW-630	4606	RTC-8517	T857	
L12A	Line Choke(3.5uh)	73A50-1	BC-564	4608	RTC-8518	T858	
B	Line Choke(3.5uh)		BC-564	4608	RTC-8518	T858	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	5300Ω	3-4Ω	79B98-1	A-3026		24S48	S-6X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	78C176-1	4A07	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	Tuning Cap.	68B85-1	3 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Tuning Indicator	21B144-1	
Knob	33B447-1	Tuning, Volume
Cabinet-Back	34D176-1	White
Cabinet-Front	34D175-1	Beige

PHOTOFACT® Folder with CIRCUITRACE®

ADMIRAL MODEL Y4017 (Ch. 5M5)

ADMIRAL MODEL
Y4017 (Ch. 5M5)

ADMIRAL MODEL
Y4017 (Ch. 5M5)

TRADE NAME	Admiral Model Y4017 (Ch. 5M5)
MANUFACTURER	Admiral Sales Corp., National Service Div., 903 Morrissey Drive, P. O. Box 845, Bloomington, Illinois
TYPE SET	AC Operated 5 Tube AM Receiver With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles
TUNING RANGE—BROADCAST	535 – 1620KC RATING 24 Watts, .23 Amp. @ 117 Volts AC (Radio)

FOR SERVICE INFORMATION ON RECORD CHANGER RC6C9N-7AD – SEE ADMIRAL RC637 SERIES – PHOTOFACT SET 398 FOLDER 7 OR RECORD CHANGER MANUAL RC-11

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4.....GENERAL CEMENT #5097, 8727
WALSCO #2515

A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

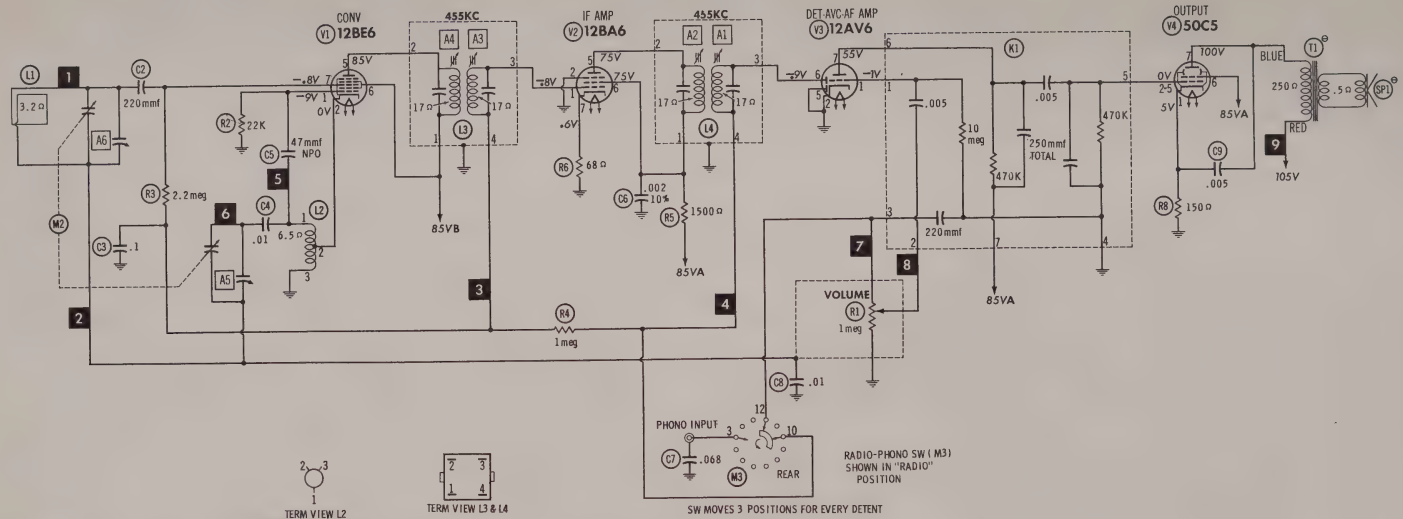
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna stator lug of tuning gang. Low side to common.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1620KC	"	"	A5	"
3.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1400KC	1400KC Signal.	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1962 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KP901

SET 561 FOLDER 4



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	45Ω	30Ω	†1200Ω	†1200Ω	4.2meg
V2	12BA6	2meg	0Ω	30Ω	15Ω	†2700Ω	†2700Ω	68Ω
V3	12AV6	10meg	0Ω	0Ω	15Ω	0Ω	1meg	†470K
V4	50C5	150Ω	470K	45Ω	105Ω	NC	†1200Ω	†283Ω
V5	35W4	NC	TP	105Ω	150Ω	148Ω	148Ω	¶ INF

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. NC NO CONNECTION TP TIE POINT
MEASURED IN "AM" POSITION LESS MOTOR.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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ADMIRAL MODEL Y4017 (Ch. 5M5)

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Output	50C5
V2	IF Amplifier	12BA6	V5	Rectifier	35W4
V3	Det.-AVC-AF Amp.	12AV6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	Ⓑ 50	150	67B39-1	PR2-030	BBRD5315	QT2-7	PWD211	TDLD-8	TVA-2450
B	Ⓒ 30	150							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C3	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C4	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	47 NPO		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C6	.002 10%		DI-2000		PM6D2	CCD-202	GY-220	10TS-D20
C7	.068 600V		P688N-068		CUB6S68	6DP-4-683	GEM-6168	6TM-S68
C8	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	75D56-4					Volume
B	Switch							Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	22K				R6	68Ω			
R3	2.2meg				R7	1200Ω 1W			
R4	1meg				R8	150Ω			
R5	1500Ω				R9	33Ω 1W			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf, .005mfd, .005mfd, 470K, 470K, 10meg	63C6-20	Aerovox PA-306 Centralab PC-159 Sprague DT-6

PRINTED BOARD

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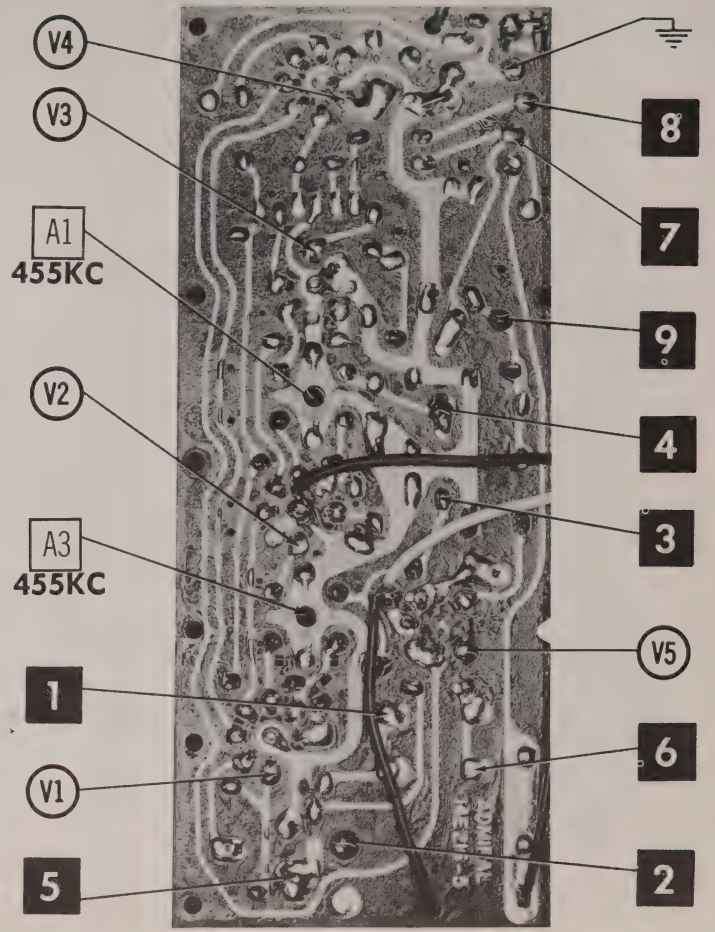
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ADMIRAL PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loop Ant.	A7798					
L2	Osc.	69A217-1					
L3	Input IF	72C170-5	BC-356	13-PC1	RTC-8641	T614	
L4	Output IF	72C170-4	BC-357	13-PC2	RTC-8642	T615	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ADMIRAL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2900Ω	3-4Ω	(Part of SP1)	A-2928	A-3876	22S46	S-30X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	78B124-3*	52A1	* Includes T1

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	ADMIRAL PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M1	409B28①	Not Req.	13TB①	Not Req.	13	Not Req.	10T2-S①	Not Req.	
	98C15-89②	Not Req.	13T②	Not Req.	13	Not Req.	10T2-S①	Not Req.	
	98C15-95③	Not Req.	13TX③	Not Req.	13	Not Req.	10T2-SD①	Not Req.	

① Includes Holder.
② Less Holder, .7 mil Sapphire & 3 mil Sapphire.
③ Less Holder, .7 mil Diamond & 3 mil Sapphire.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M2	Tuning Cap.	68C76-6	2 Gang
M3	Switch	76B34-1	Function Selector

CABINETS & CABINET PARTS

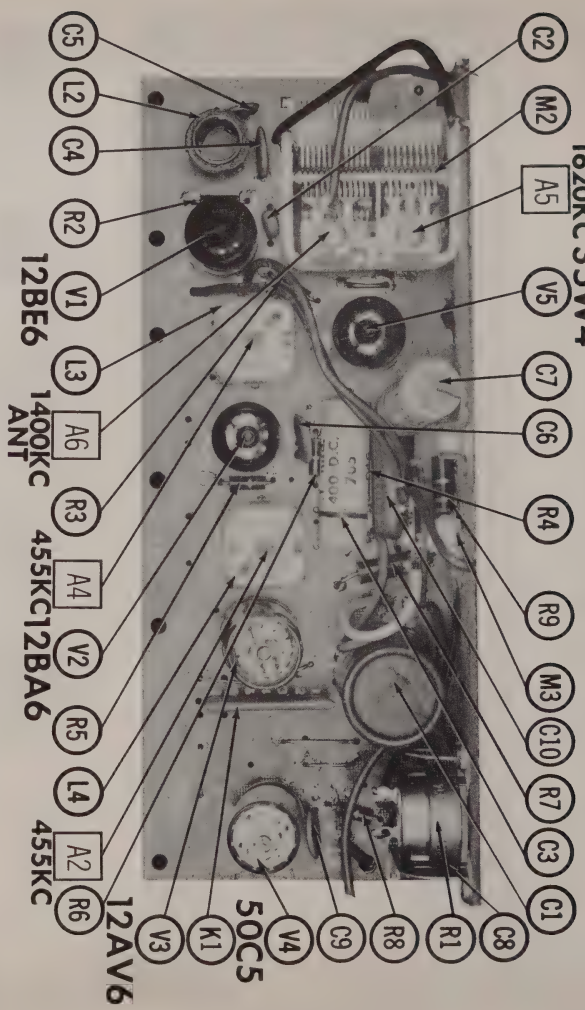
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33C350-3	Tuning
Knob	33C350-2	Volume
Knob	403B98	Changer Controls, Brown
Cabinet	35E616-1	Mohave Brown & Saddle Tan
Handle	35E616-54	Carrying

WIRING DATA

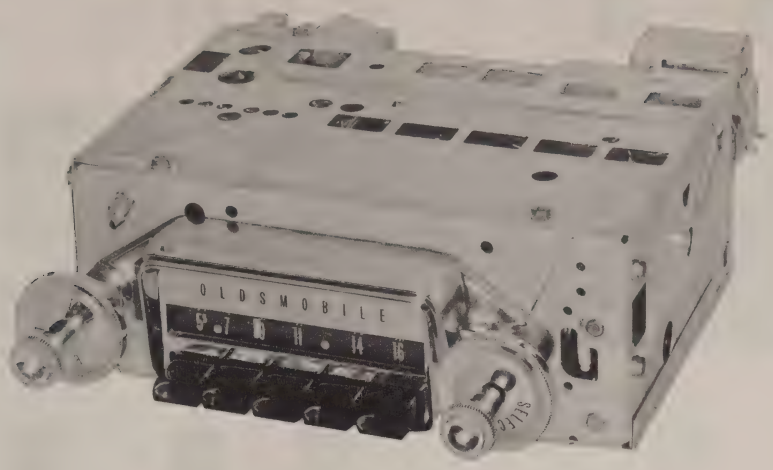
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

BUICK MODEL 980132
OLDSMOBILE MODEL 989387
PONTIAC MODEL 989831



TRADE NAME	Buick Model 980132 (For 1961 Buick Specials) Oldsmobile Model 989387 (For 1961 Oldsmobile F85) Pontiac Model 989831 (For 1961 Pontiac Tempests)
MANUFACTURER	Delco Radio Div., General Motors Corp., Kokomo, Indiana
TYPE SET	Battery Operated 4 Tube — 1 Transistor Custom-Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.8 Amp. @12.6 Volts DC
TUNING RANGE	540 — 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A5, A9, A10..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544

A6, A7, A8..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262KC (400% Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of Oscillator core (A5). Rear of core should be 1 5/8" from mounting end of coil forms.					
2.	High side thru 82mmf to antenna receptacle. Low side to chassis.	1615KC	"	"	A6, A7, A8	"
3.	"	600KC	600KC Signal.	"	A9, A10	"
4.	"	1615KC	High end stop.	"	A7, A8	"
5.	"	900KC	900KC Signal.	"		Adjust pointer adjustment until pointer coincides with 1100 on dial.
6.	With radio installed in car and antenna fully extended, tune in a weak station and adjust A8 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull pushbutton out, then press in firmly.
3. Repeat for remaining pushbuttons.

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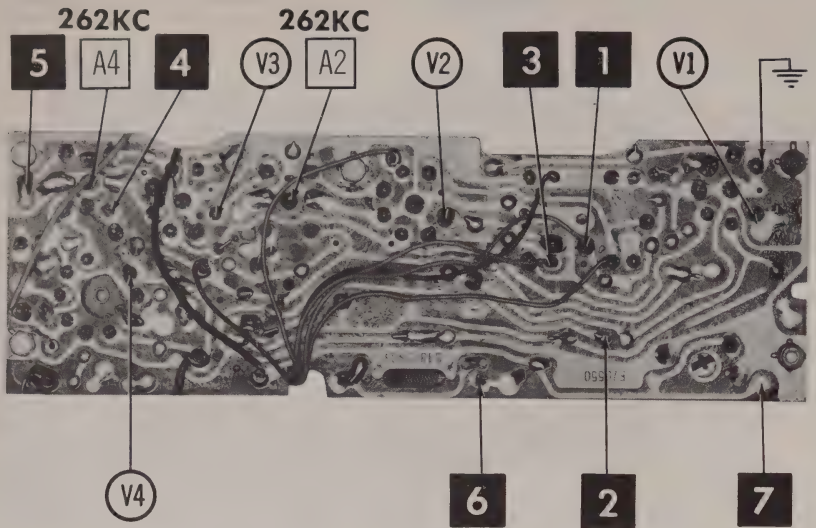
KD949

BUICK MODEL 980132
OLDSMOBILE MODEL 989387
PONTIAC MODEL 989831

BUICK MODEL 980132
OLDSMOBILE MODEL 989387
PONTIAC MODEL 989831

SET 561 FOLDER 5



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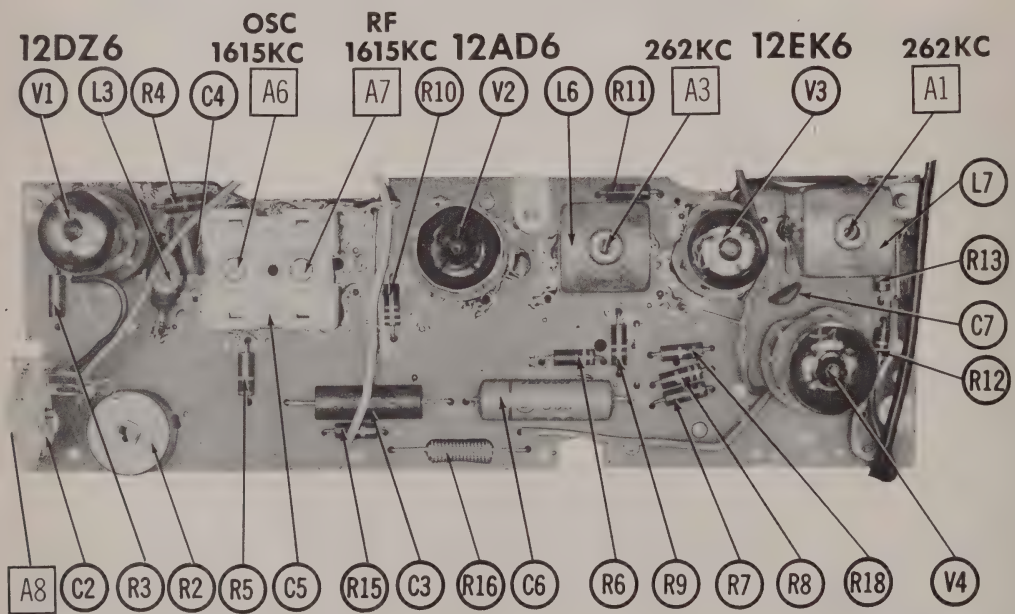
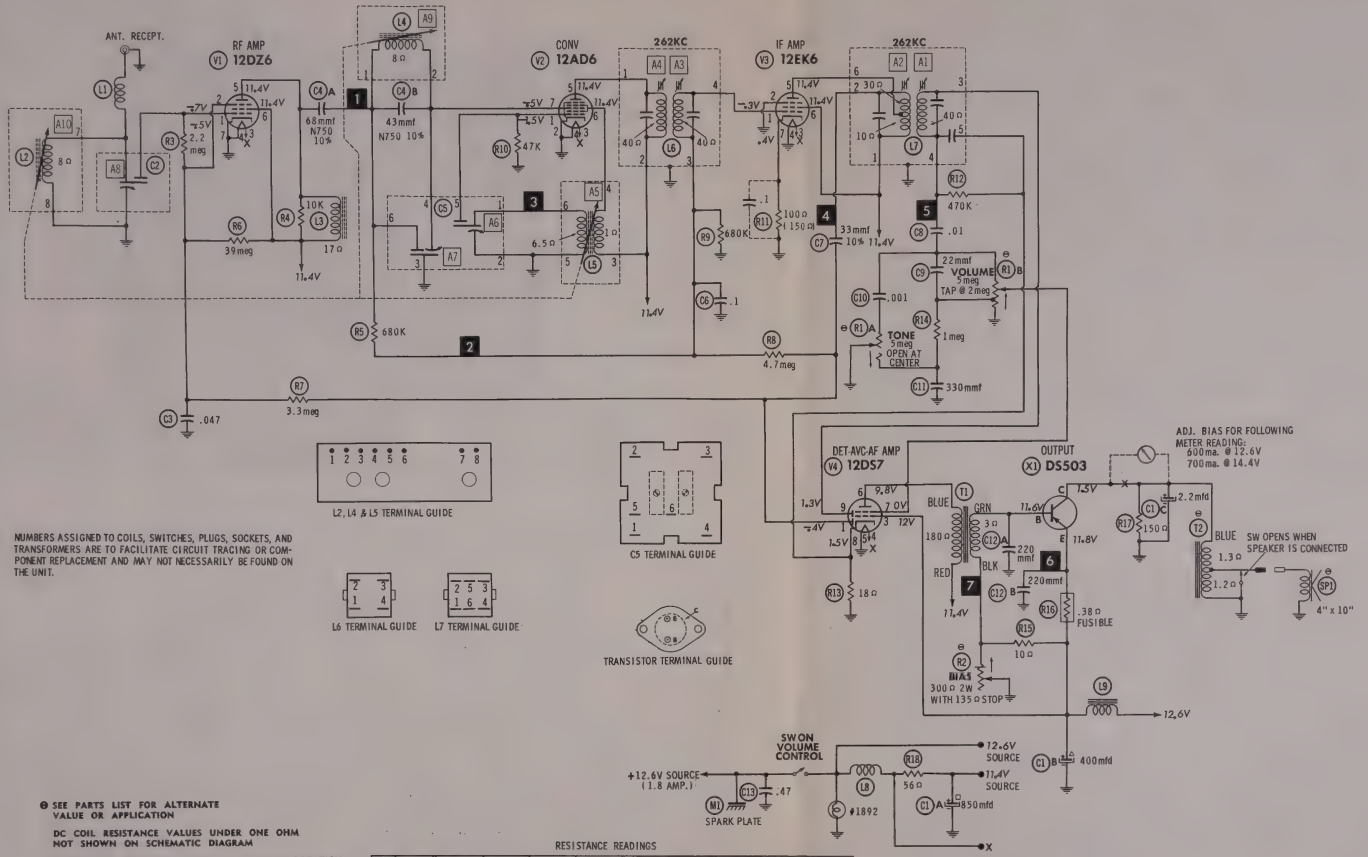
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PRINTED BOARD-TOP VIEW



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DZ6	9 meg	7 meg	FIL	FIL	70Ω	60Ω	0Ω		
V2	12AD6	47K	0Ω	FIL	FIL	100Ω	60Ω	1.3 meg		
V3	12EK6	680K	0Ω	FIL	FIL	85Ω	60Ω	100Ω		
V4	12DS7	5 meg	TP	4Ω	FIL	FIL	240Ω	0Ω	18Ω	470K

TRANSISTOR CIRCUIT RESISTANCE FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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BUICK MODEL 980132
OLDSMOBILE MODEL 989387
PONTIAC MODEL 989831

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	◆ GENERAL ELECTRIC ◆			RAYTHEON ◆ SYLVANIA ◆	
V1	RF Amplifier	12DZ6	V3	IF Amplifier	12EK6
V2	Converter	12AD6	V4	Det. -AVC-AF Amp.	12DS7

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	DS503	Output	2N176		PNP

Note 1. When replacing, apply silicone grease between transistor and heat sink. Tighten mounting screws securely. Check bias adjustment.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	■850	16	7273730	AFH3-54-30			WP300.6		TVLS-3021*
B	▲400	16							
C	2.2	11.5AC							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2		#7276666						
C3	.047 75V		P288N-047	DD-503	CUB2S47	1DP-2-473	GEM-2147	2TM-S47
C4A	68 N750 10%		N750-DI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-68
B	43 N750 10%		N750-DI 39	TCN-43	C10Q43U	CCTN-390	CN7-439	10TCU-Q39
C5		#7276498						
C6	.1 75V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P10
C7	33 10%		DI-33	DD-330	L10Q33	CCD-330	GP433	10TS-Q33
C8	.01 400V		P486N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C9	22		DI-22	DD-220	L10Q22	CCD-221	GP422	10TS-Q22
C10	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C12A	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
B	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C13	.47 100V		P288N-47		CUB2P47	1DP-4-474	GEM-2047	2TM-P47

Delco Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5meg*	1/2	7276521①					
B	5meg	1/2					■ UE4244-S	Tone / Volume
C	Switch							Power Off-On
R2	300Ω 135Ω Stop	2(WW)	7275474②					Bias

* Open at Center of Rotation. Low end 1meg, high end 4meg.
① Model 989831 uses Part #7278930.
Model 980132 uses Part #7276561.
② Temperature Compensated.
■ "STA-LOC" Equivalent: FL56X, RU56T26, OS1375, IS2000, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	2.2meg				R11	100Ω			(150Ω)*
R4	10K				R12	470K			
R5	680K				R13	18Ω			
R6	39meg				R14	1meg			
R7	3.3meg				R15	10Ω			
R8	4.7meg				R16	.33Ω			Pt. #7276499
R9	680K				R17	150Ω			
R10	47K				R18	56Ω			

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		DELCO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	RF Choke (6.5uh)	7255738	BC-565	4610	RTC-8520	T858	
L2	Ant.	1221138					
L3	RF Choke (1.8MH)	7269684	BC-514	4664	RTC-8533	T875	
L4	RF	1221138					
L5	Osc.	1221151					
L6	Input IF	1221257	BC-344	13-PH1	RTC-8644	T655	
L7	Output IF	1221255	BC-424				
L8	Hash Choke (1.4uh)	7241708					

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L9		.7Ω	.011 HY	7274342		TC-2			

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6.8	1	1221590		TA-48			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA					NOTES
	PRI.	DELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	10Ω Tap ⓐ 3-4Ω	1221499①		TA-50			① Part #1221535 used in Model 989831

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	4"x 10"	PM	3-4Ω	7276481 *	410A2	* Model 989387
	4"x 10"	PM	3-4Ω	7276434 ‡		‡ Model 980132 and some versions of 989387
	4"x 10"	PM		7276547 ♦		♦ Model 989831

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M1	Spark Plate	7271564	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	1221067	Models 989387, 989831
Dial Pointer	1221506	Model 980132
Pushbutton	7276507	
Knob	1192976	Tuning, Volume, Model 980132
Knob	1192589	Tone, Model 980132
Knob	1192588	Dummy, Model 980132
Knob	535908	Tuning, Volume, Model 989831
Knob	579159	Tuning, Volume, Model 989387
Knob	539611	Tone, Model 989831
Knob	579156	Tone, Model 989387
Knob	579157	Dummy, Model 989387
Knob	539610	Dummy, Model 989831

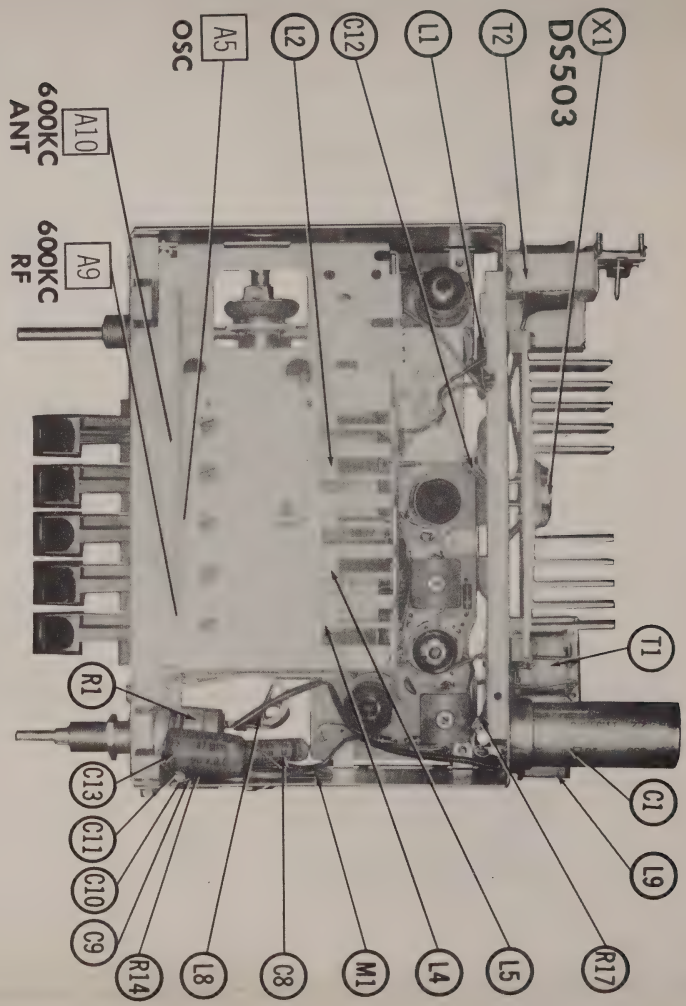
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Shielded Hook-up Wire ..... Use BELDEN No. 8885

Bonding Strap ..... Use BELDEN No. 8661

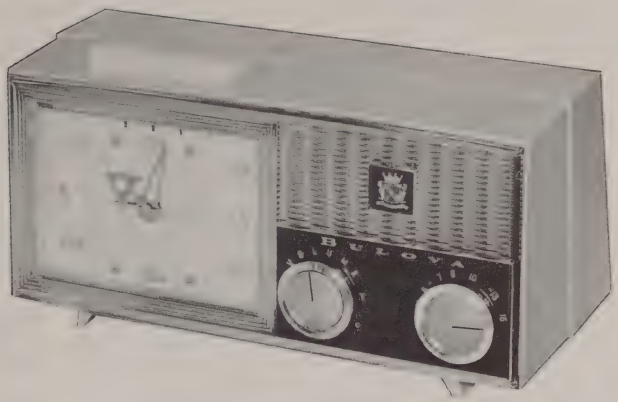
CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

BULOVA MODELS 140, 142, 143, 145, 146, 162, 170, 173, 176, 179, 180, 182, 183, 189, 190, 192, 193, 196, 197, 199

BULOVA MODELS 140, 142, 143, 145, 146, 162, 170, 173, 176, 179, 180, 182, 183, 189, 190, 192, 193, 196, 197, 199



BULOVA MODELS 140, 142, 143, 145, 146, 162, 170, 173, 176, 179, 180, 182, 183, 189, 190, 192, 193, 196, 197, 199

TRADE NAME	Bulova Models 140, 142, 143, 145, 146, 162, 170, 173, 176, 179, 180, 182, 183, 189, 190, 192, 193, 196, 197, 199
SUPPLIER	Bulova Watch Co., Bulova Park, Flushing 70, N. Y.
TYPE SET	AC Operated 5 Tube AM Receiver With Electric Clock
POWER SUPPLY	110 - 120 Volts AC, 60 RATING 30 Watts, .32 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540 - 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: Al thru A4 .... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open	Across Voice Coil	Al, A2, A3, A4	Adjust for maximum output.
2.	"	1600KC	1600KC	"	A5	"
3.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1400KC	1400KC Signal	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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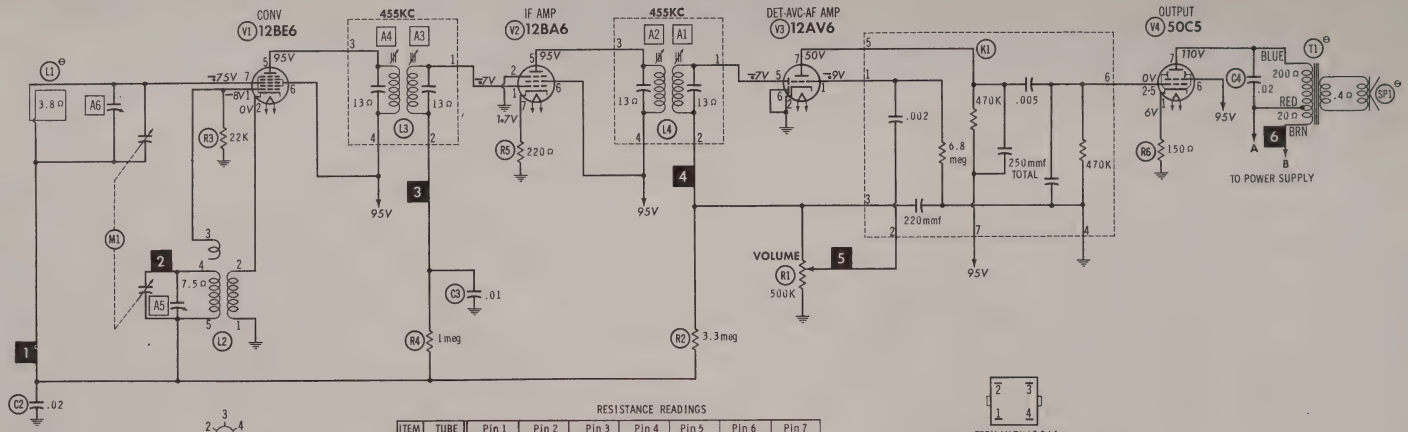
KG991

SET 561 FOLDER 6



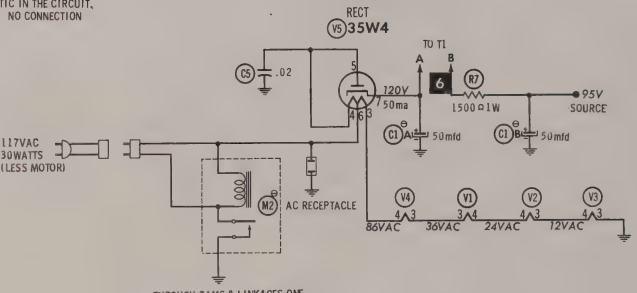
TERM VIEW L2

TERM VIEW L3 & L4

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	30Ω	20Ω	†1500Ω	†1500Ω	3.8meg
V2	12BA6	4.8meg	0Ω	10Ω	20Ω	†1500Ω	†1500Ω	220Ω
V3	12AV6	6.8meg	0Ω	0Ω	10Ω	500K	0Ω	†470K
V4	50C5	150Ω	470K	30Ω	80Ω	NC	†1500Ω	†200Ω
V5	35W4	NC	NC	80Ω	110Ω	110Ω	108Ω	¶ INF

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5. NC NO CONNECTION



THROUGH CAMS & LINKAGES ONE SWITCH PERFORMS ALL FUNCTIONS OF ON-OFF-AUTO & SLEEP.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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BULOVA MODELS 140, 142, 143, 145, 146, 162, 170, 173, 176, 179, 180, 182, 183, 189, 190, 192, 193, 196, 197, 199

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Output	50C5
V2	IF Amplifier	12BA6	V5	Rectifier	35W4
V3	Det. - AVC - AF Amp.	12AV6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BULOVA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	50	150	10-8 ①	PR2-035	BBRD5515	QT2-9	PWD221	TDLD-9	TVA-2453
B	50	150							

① Model 170 Series use Part #10-22.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C3	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C5	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BULOVA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	22-12	B-60	A47-500K-Z	QJ3-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	3.3meg				R5	220Ω			
R3	22K				R6	150Ω			
R4	1meg				R7	1500Ω 1W			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BULOVA PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf, .002mfd, .005mfd, 470K, 470K, 6.8meg		Aerovox PA-511-2 Centralab PC-157 Mallory MS-106 (Note 1) Sprague DT-4 Note 1 Reverse Leads 5 and 6.

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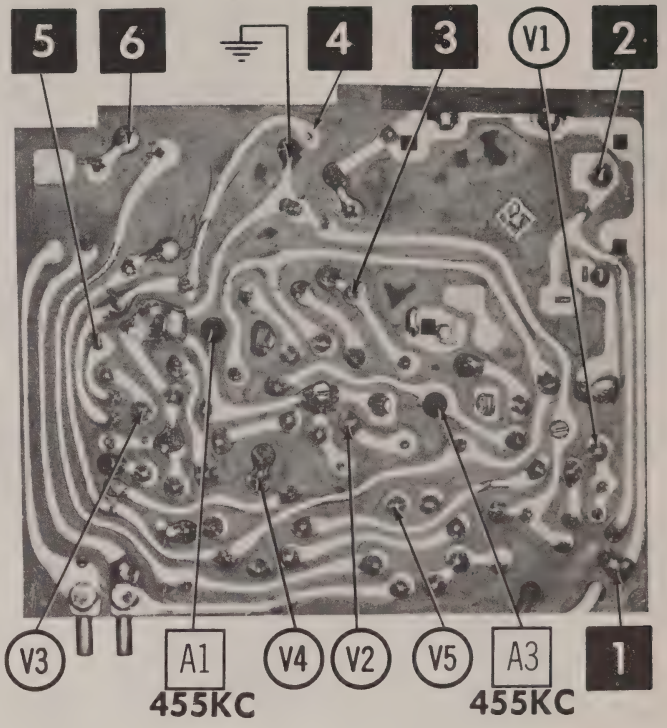
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



BULOVA MODELS 140, 142, 143, 145, 146, 162, 170, 173, 176, 179, 180, 182, 183, 189, 190, 192, 193, 196, 197, 199

FOLDER 6

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BULOVA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loop Ant.	60-15 ①					① Model 180 Series. Part #60-12 used in 160, 170 Series.
L2	Osc.	20-6					
L3	Input IF	24-9	BC-356	13-PC1	RTC-8641	T614	
L4	Output IF	24-9	BC-357	13-PC2	RTC-8642	T615	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	BULOVA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω Tap @ 9%	3-4Ω	(Part of SP1)				S-16X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BULOVA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	26-13 ‡	4A07	‡ Includes T1. Models 160, 180 Series.
	4"	PM		26-14 ♦		♦ Includes T1. Model 170 Series.

MISCELLANEOUS

ITEM No.	PART NAME	BULOVA PART No.	NOTES
M1	Tuning Cap.	12-13	2 Gang
M2	Clock Assembly	80-15	Complete, Model 180 Series
	Clock	80-10	Model 162
	Clock	80-12	Model 170 Series

CABINETS & CABINET PARTS

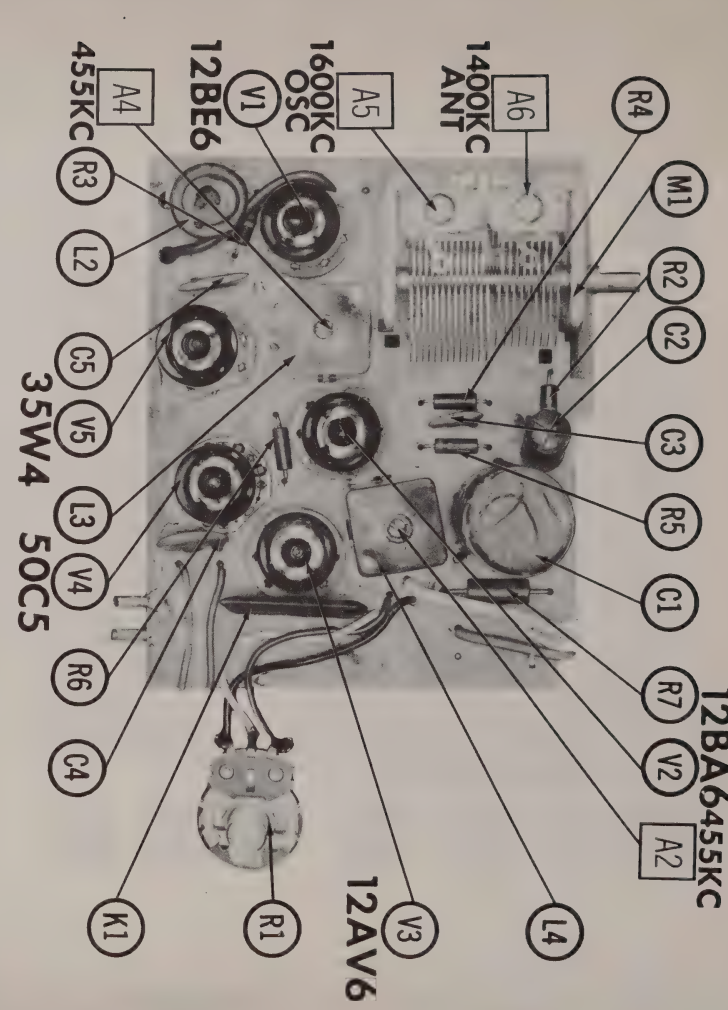
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Clock Crystal	80-9	Model 160 Series
Clock Crystal	80-14	Model 170 Series
Clock Knob	78-31	Model 170 Series
Clock Knob	78-42B	Model 180 Series
Knob	78-30	Tuning, Volume, Models 160, 170 Series
Knob	78-43	Tuning, Volume, Model 180 Series
Cabinet Back	70-76B	Model 180 Series (Specify Color)
Cabinet Front	70-76F	Model 180 Series (Specify Color)
Cabinet	70-76	Model 180 Series (Specify Color), Less Bezel
Cabinet	70-76C	Model 180 Series (Specify Color), Complete
Cabinet	70-56	Model 162, Ebony, Complete
Cabinet	70-57	Model 170 Series (Specify Color), Complete

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



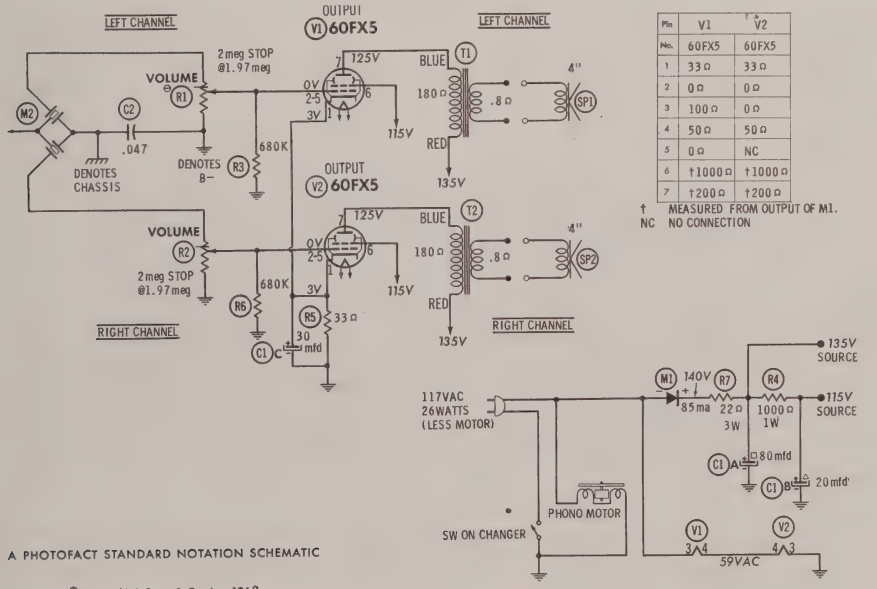
PHOTOFACT® Folder

EMERSON MODELS 937B, 946B
(Ch. 120558B, 120567B)

TRADE NAME	Emerson Models 937B (Ch. 120558B), 946B (Ch. 120567B)
MANUFACTURER	Emerson Radio & Phonograph Corp., 524 W, 23rd Street, New York 11, N. Y.
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 26 Watts, .32 Amp. @117 Volts AC (Less Motor)

MODEL 937B: FOR SERVICE INFORMATION ON 4 SPEED AUTOMATIC RECORD CHANGER 819166 – SEE SIMILAR B.S.R. UA14 – PHOTOFACT SET 465 FOLDER 6

MODEL 946B: FOUR SPEED MANUAL RECORD PLAYER



Pin No.	V1	V2
1	33Ω	33Ω
2	0Ω	0Ω
3	100Ω	0Ω
4	50Ω	50Ω
5	0Ω	NC
6	†1000Ω	†1000Ω
7	†200Ω	†200Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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KT881

EMERSON MODELS 937B, 946B
(Ch. 120558B, 120567B)
EMERSON MODELS 937B, 946B
(Ch. 120558B, 120567B)
SET 561 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel Output	6QFX5	V2	Right Channel Output	6QFX5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	■80	200	925541	AFH3-84-75			WP227.35		
B	▲20	150					TT6X30		
C	30	5							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	390664 ①	B-76 *	A47-2meg-Z*	Q13-139*	U55*	Volume, Left Channel
	1.97meg Stop							
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R2A	2meg	½	390664	B-76 *	A47-2meg-Z*	Q13-139*	U55 *	Volume, Right Channel
	1.97meg Stop							
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	

① Model 946B uses Part #390665 (with switch).
* Use 33K Resistor in series with right hand terminal, viewed shaft end terminals down.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	680K			
R4	1000Ω 1W			
R5	33Ω			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R6	680K			
R7	22Ω 3W	PW3-22	3W-SQ-22	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA EMERSON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	3700Ω	3-4Ω	734208				S-14Z	
T2	3700Ω	3-4Ω	734208				S-14Z	

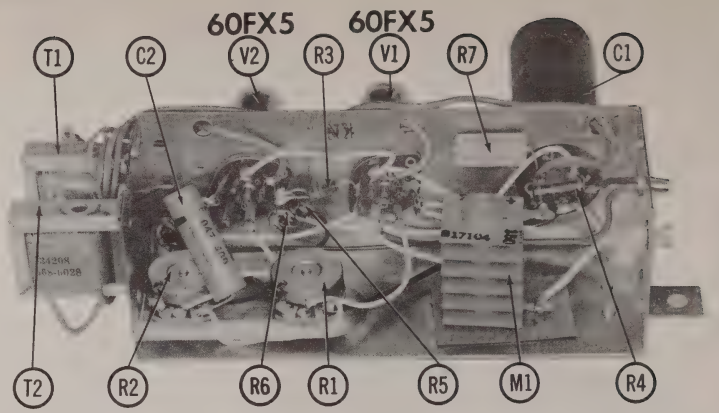
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	180247	4A07	
SP2	4"	PM	3-4Ω	180247	4A07	

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA EMERSON PART No.	RCA PART No.	SARKES TARZIAN PART No.	NOTES
M1	.085A	817104 †	1N1763 ǂ	150†	† Selenium ǂ Silicon

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	EMERSON PART No. CARTRIDGE	EMERSON PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2	963087 †	963094* (LP)	76TS	N8-7*	96T	Not Req.	12TH-S	N-12TH-S*	Model 937B † Includes Needles
		963095* (78RPM)		N8-3*					
	963079 †	963080* (LP)							Model 946B † Includes Needles
		963081* (78RPM)							

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	460668A	Model 937B
Knob	460668B	Model 946B
Cabinet	141215	Coral, Model 946B
Cabinet	141215A	Black, Model 946B
Cabinet	141215B	Metallic Blue, Model 946B
Cabinet	141204A	Ebony, Model 937B
Cabinet	141204	Silver, Model 937B

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

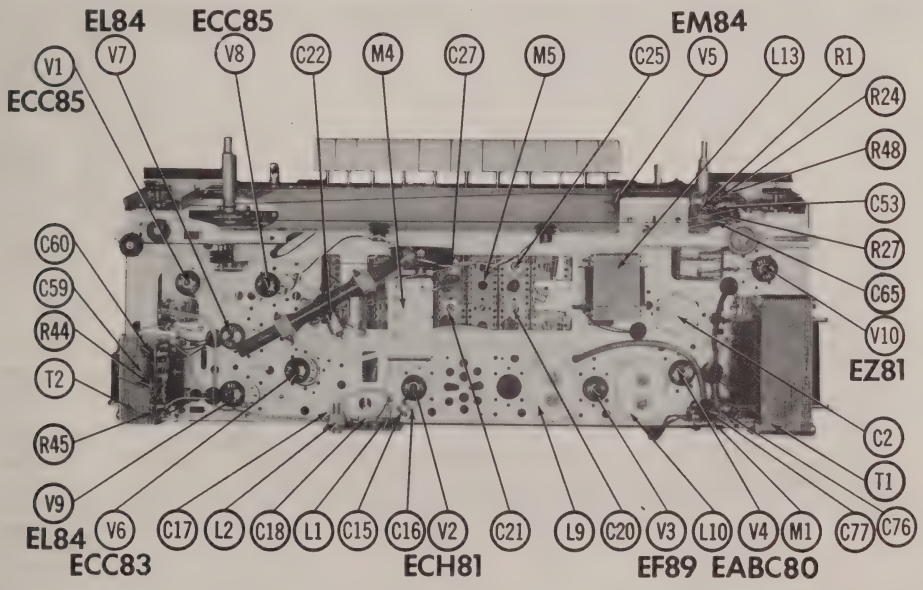
EMUD MODELS
920, 921

EMUD MODELS
920, 921

TRADE NAME	Emud Models 920, 921
IMPORTER	Delmonico International, Div. of Thompson-Starrett Co., Inc., 120-20 Roosevelt Ave., Corona 68, N. Y.
TYPE SET	AC Operated 10 Tube FM-BC-SW Receiver with Stereo Amplifier and 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 90 Watts, .8 Amp. @117 Volts AC (Less Motor)
TUNING RANGE—BROADCAST	515 – 1620KC FREQ. MOD. 88 – 108MC SHORT WAVE 5.9 – 10MC

MODEL 920: FOR SERVICE INFORMATION ON RECORD CHANGER PART #920-15 – SEE B.S.R. UA8 –PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11

MODEL 921: FOR SERVICE INFORMATION ON RECORD CHANGER PART #921-15 – SEE TELEFUNKEN TW560 – PHOTOFACT SET 371 FOLDER 12 OR RECORD CHANGER MANUAL RC-10



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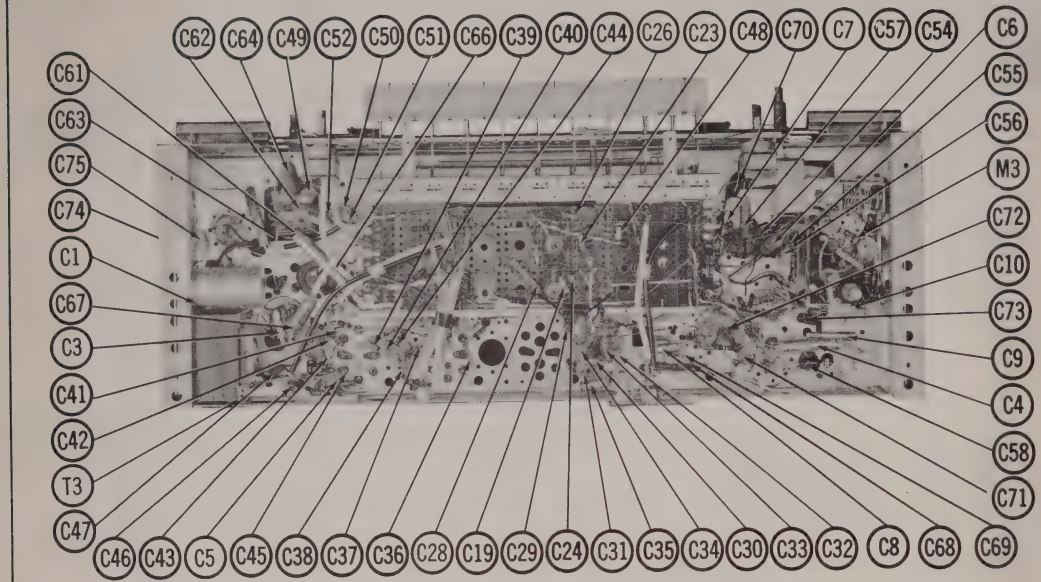
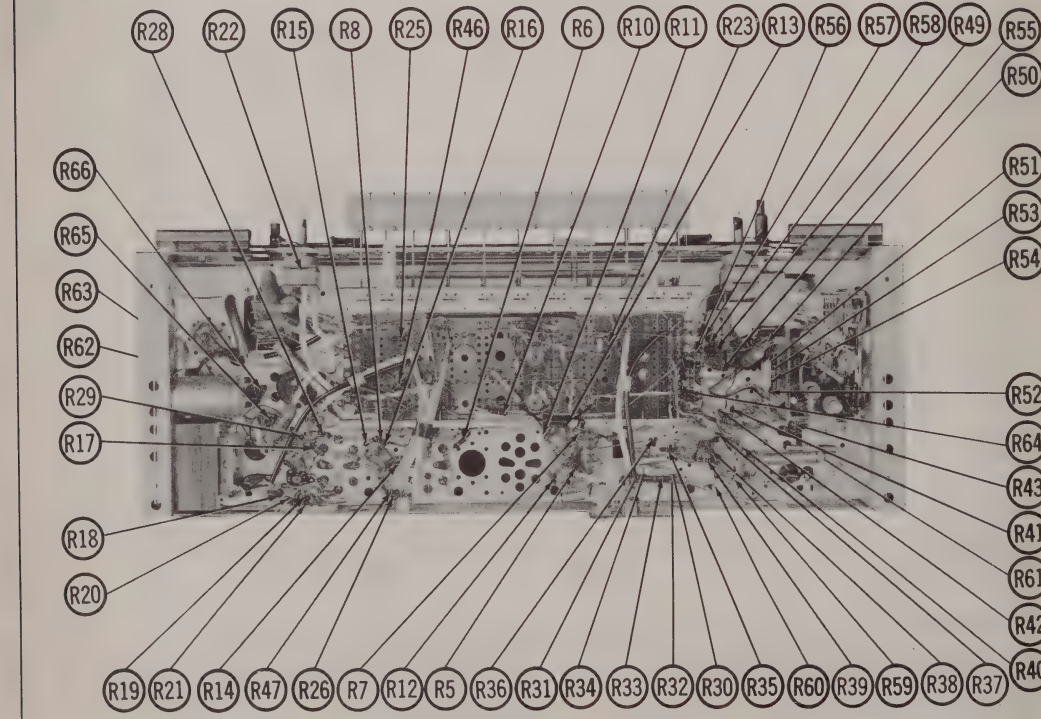
KN834

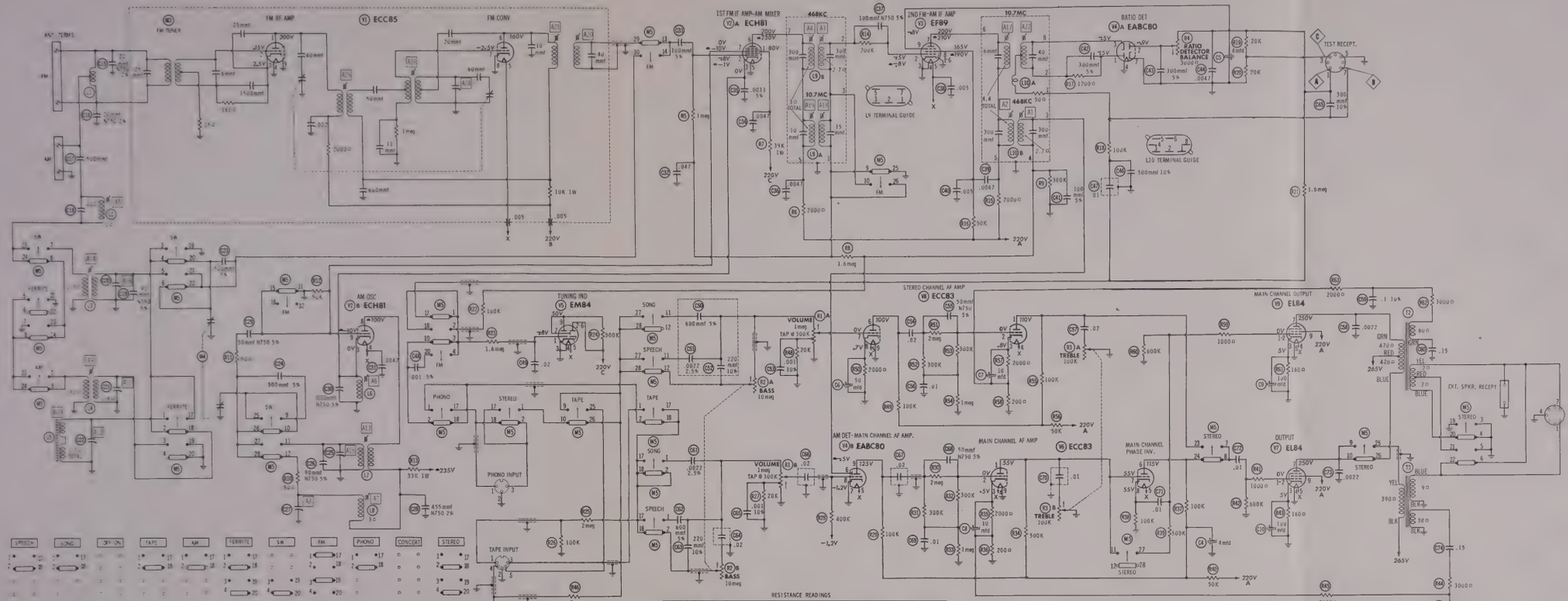
SET 561 FOLDER 8



CHASSIS BOTTOM VIEW-CAPACITOR, TRANSFORMER & MISC IDENT.



CHASSIS BOTTOM VIEW-RESISTOR IDENT.



RESISTANCE READINGS

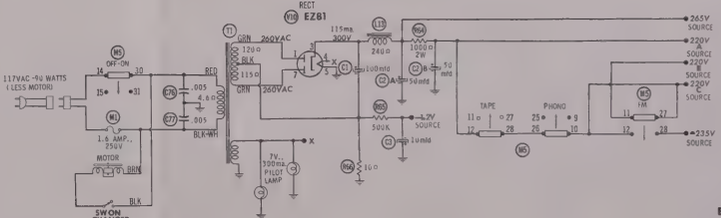
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†3700Ω	15Ω	195Ω	FIL	FIL	†11K	1meg	0Ω	0Ω
V2	ECH81	40K	1meg ±3meg	.3Ω	FIL	FIL	†3200Ω	0Ω -50K	-134K	-50K
V3	EF89	NC	200K -2.2meg	0Ω	FIL	FIL	0Ω	†3200Ω	†5IK	40K
V4	EABC80	INF	42K	INF	FIL	FIL	-300K	0Ω	900K	†150K
V5	EM84	2.8meg -2meg	NC	0Ω	FIL	FIL	†1200Ω	†500K	NC	†500K
V6	ECC83	†550K	1.3meg	2200Ω	FIL	FIL	†50K	†650K	100K	FIL
V7	EL84	NC	600K	160Ω	FIL	FIL	NC	†630Ω	NC	†1200Ω
V8	ECC83	†150K	1.3meg	2200Ω	FIL	FIL	†150K	0Ω	2000Ω	FIL
V9	EL84	NC	600K	160Ω	FIL	FIL	NC	†710Ω	NC	†1200Ω
V10	EZ81	120Ω	NC	¶ INF	FIL	FIL	NC	115Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
← MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 3 OF V10.
NC NO CONNECTION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

TUBE LAYOUT (BOTTOM VIEW)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

EMUD MODELS 920, 921

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools:
A7, A9, A13, A14.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 2 (grid) of AM Mixer. Low side to chassis.	468KC (400~ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side to AM antenna terminal. Low side to chassis.	"	"	"	A5, A6	Adjust for MINIMUM output.
3.	"	515KC	Tuning gang fully closed.	"	A7	Adjust for maximum output.
4.	"	1620KC	Tuning gang fully open.	"	A8	"
5.	"	600KC	600KC	"	A9, A10	"
6.	"	1400KC	1400KC	"	A11, A12	"
7.	"	5.9MC	(SW) 5.9MC	"	A13, A14	"
8.	"	10MC	10MC	"	A15, A16	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A17, A18, A19, A20, A21	Adjust for maximum deflection.
10.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A22	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	Across FM antenna terminals.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A17, A18, A19, A20, A21	Disconnect stabilizing capacitor C5. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C5.
10.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A22	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A17 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	Across FM antenna terminals.	88MC (Unmod.)	(FM) 88MC	DC probe to point Ⓐ. Common to chassis.	A23	Adjust for maximum deflection.
12.	"	108MC	108MC	"	A24	"
13.	"	98MC	98MC	"	A25	"

FIG. 1

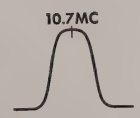
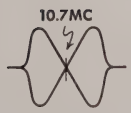


FIG. 2



PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	GENERAL ELECTRIC • RAYTHEON • SYLVANIA • TYPE
V1	FM RF Amp. -FM Conv.	ECC85
V2	1st FM IF Amp. - AM Mixer -AM Osc.	ECH81
V3	2nd FM IF Amp. -AM IF Amp.	EF89
V4	Ratio Det. -AM Det. - Main Channel AF Amp.	EABC80
V5	Tuning Indicator	EM84
V6	Main Channel AF Amp. - Phase Inverter	ECC83
V7	Output	EL84
V8	Stereo Channel AF Amp.	ECC83
V9	Main Channel Output	EL84
V10	Rectifier	EZ81

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA EMUD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	100	350				TC69			
C2A	50	350		PRS2420		TCD78			
B	250	350							
C3	10	12		PTT53	NLW10-15	MT1-5	TT12X10	MLV10-12	TE-1128
C4	4	350		PRS1600	BR435	QT1-2.1	TC597	TD-4-450	TVA-1601
C5	4	100		PRS1400	NLW4-150	MT1-4	TT150X4	MLV5-100	TE-1403
C6	50	15		PTT72	NLW50-15	MT1-66	TT15X50	MLV50-15	TE-1260
C7	10	12		PTT53	NLW10-15	MT1-5	TT12X10	MLV10-12	TE-1128
C8	10	12		PTT53	NLW10-15	MT1-5	TT12X10	MLV10-12	TE-1128
C9	100	12		PTT60	NLW100-12	MT1-19	TT15X100	MLV100-12	TE-1135
C10	100	12		PTT60	NLW100-12	MT1-19	TT15X100	MLV100-12	TE-1135
C11	4	100		PRS1400	NLW4-150	MT1-4	TT150X4	MLV5-100	TE-1403
C12	100	12NP		PRS7340	BR10015		TCN425		TVAN8-1207.1*
C13	4	100		PRS1400	NLW4-150	MT1-4	TT150X4	MLV5-100	TE-1403
C14	100	12NP		PRS7340	BR10015		TCN425		TVAN8-1207.1*

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C15	20 N750 2%							
C16	20 N750 2%							
C17	500		SI 500	D6-501	BYA10T5	CCD-501	B-350	10TS-T50
C18	.001		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	90 N750 5%			TCN-91	C10Q91U			
C20								
C21								
C22								
C23	500 5%				5R5T5	CM-19B-501J	MCE245	MS-35
C24	500 5%				5R5T5	CM-19B-501J	MCE245	MS-35
C25								
C26	90 N750 5%			TCN-91	C10Q91U			
C27								
C28	455 N750 2%							
C29	50 N750 5%			TCN-50	C10Q5U			
C30	300 N750 5%			TCN-300	C10T3U			
C31	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C32	047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-6147	2TM-S47
C33	100 5%		NPO-SI 100	TCZ-100	C10TIC	CM-19B-101J	CNO-310	10TCC-T10
C34	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C35	.0033 5%				1RSD33	CM-20B-332J	MCJ462	MS-233
C36	.0047		SI 4700	D6-473	BYA10D47M	CCD-472	B-247	5HK-D47
C37	100 N750 5%			TCN-100	C10T1U			CN7-310
C38	.005		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D5
C39	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C40	.005		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50
C41	100 5%		NPO-SI 100	TCZ-100	C10TIC	CM-19B-101J	CNO-310	10TCC-T10
C42	330 5%			TCZ-330	5R3T3	CM-19B-301J	MCE241	10TCC-T30
C43	300 5%			TCZ-300	5R5T3	CM-19B-301J	MCE241	10TCC-T30
C44	.0047		SI 4700	D6-473	BYA10D47M	CCD-472	B-247	5HK-D47
C45	300 10%			D6-301	5R5T3	CCD-301	GP330	10TS-T30
C46	500 10%			D6-501	5R5T5	CCD-501	GP350	10TS-T50
C47	.01 500V							
C48	.001 5%				5R5D1	CM-19B-102J	MCJ255	MS-21
C49	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-613	6TM-S20
C50	600 5%					CM-20E-222G	MCE459	MS-36
C51	.0022 2.5%							
C52	220 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C53	.001 10%				5R5D1	CCD-102	GP210	10TS-D10
C54	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C55	50 N750 5%			TCN-50	C10Q5U			
C56	.01 125V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C57	.02 500V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S20
C58	.0022 500V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C59	.1 125V 10%		V94C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P10
C60	.15 250V		P488N-15		CUB4P15	4DP-4-154	GEM-415	4TM-P15
C61	.0022 2.5%					CM-20E-222G	MCE459	
C62	600 5%				5R5T6			MS-36
C63	220 10%			D6-221	L10T22	CCD-221	B-322	10TS-T22
C64	.02 500V	Note 1						
C65	.001 10%				5R5D1	CCD-102	B-210	10TS-D10
C66	.02 500V	Note 1						
C67	.02 500V	Note 1						
C68	50 N750 5%			TCN-50	C10Q5U			
C69	.01 125V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C70	.01 500V	Note 1						
C71	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C72	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C73	.0022 500V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C74	.15 250V		P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C75	.05 125V		P488N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C76	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C77	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50

Note 1. Shielded Unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMUD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	920-29					Volume, Main Channel
B	300K Tap 1meg 300K Tap	½						Volume, Stereo Channel
R2A	10meg	½	920-30					Bass, Main Channel
B	10meg	½						Bass, Stereo Channel
R3A	100K	½	920-31					Treble, Main Channel
B	100K	½						Treble, Stereo Channel
R4	3000Ω	½	920-96					Ratio Detector Balance

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R5	1meg			
R6	2000Ω			
R7	39K 1W			
R8	1.6meg			
R9	300K			
R10	50Ω			
R11	50Ω			
R12	50K			
R13	33K 1W			
R14	200K			
R15	2000Ω			
R16	50K			
R17	1200Ω			
R18	100K			
R19	20K			
R20	20K			
R21	1.6meg			
R22	100K			
R23	1.6meg			
R24	500K			
R25	2meg			
R26	100K			
R27	20K			
R28	400K			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R29	100K			
R30	2meg			
R31	300K			
R32	300K			
R33	1meg			
R34	500K			
R35	3000Ω			
R36	300Ω			
R37	100K			
R38	100K			
R39	500K			
R40	50K			
R41	1000Ω			
R42	600K			
R43	160Ω			
R44	3000Ω			
R45	2000Ω			
R46	2meg			
R47	100K			
R48	20K			
R49	100K			
R50	2000Ω			
R51	2meg			
R52	300K			

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R53	300K			
R54	1meg			
R55	100K			
R56	50K			
R57	2000Ω			
R58	200Ω			
R59	1000Ω			
R60	600K			
R61	160Ω			
R62	3000Ω			
R63	2000Ω			
R64	1000Ω 2W			
R65	500K			
R66	10Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA EMUD PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No	NOTES
L1	Ant. Matching						
L2	468KC IF Trap						
L3	SW Ant.						
L4	BC Ant.						
L5	Loopstick	920-27	BC-419	705-A		T532	
L6	468KC IF Trap						
L7	SW Osc.						
L8	BC Osc.						
L9A	2nd FM IF	920-21					
B	1st AM IF						
L10A	Ratio Detector	920-22					
B	2nd AM IF						

CROSSOVER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L11		.3Ω	1.6MH						
L12		.3Ω	1.6MH						

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L13	.115A	240Ω	11 HY	920-26					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V Ⓐ .8A	520VCT Ⓐ .115A DC	6.3V Ⓐ 4.9A	920-23					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. 1	REPLACEMENT DATA EMUD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4700Ω CT	1-2Ω	920-25					
		SEC. 2						
		73Ω						
		SEC. 1						
T3	2800Ω	1-2Ω	920-24					
		SEC. 2						
		80Ω						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA EMUD PART No.	QUAM PART No.	NOTES
SP1	7"x10½"	PM	3-4Ω	920-32		
SP2	5"x 7"	PM	3-4Ω	920-33		
SP3	2 3/4"	PM	1-2Ω	920-34		
SP4	7"x 10½"	PM	3-4Ω	920-32		
SP5	5"x 7"	PM	3-4Ω	920-33		
SP6	2 3/4"	PM	1-2Ω	920-34		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA EMUD PART No. FUSE	EMUD PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1		1 6/10A 250V						

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	EMUD PART No. CARTRIDGE	EMUD PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2			76-TS-TP	N8-7*	26S	S1-1*	9TA4-S	N-9TA-S*	
				N8-3*		S1-3*			

MISCELLANEOUS

ITEM No.	PART NAME	EMUD PART No.	NOTES
M3	FM Tuner	920-18	Complete
M4	Tuning Cap.	920-28 VC2	2 Gang (N SF 521/22)
M5	Switch	920-17	Pushbutton Assembly Complete

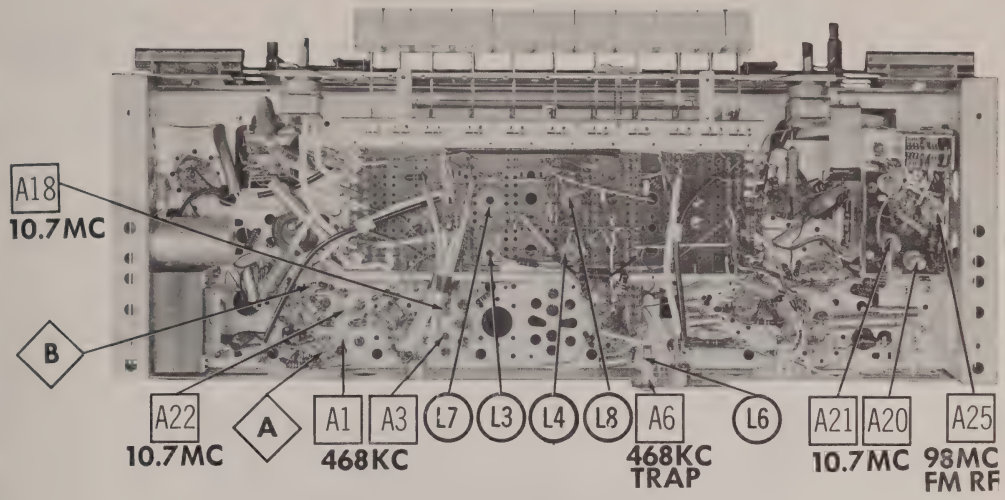
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

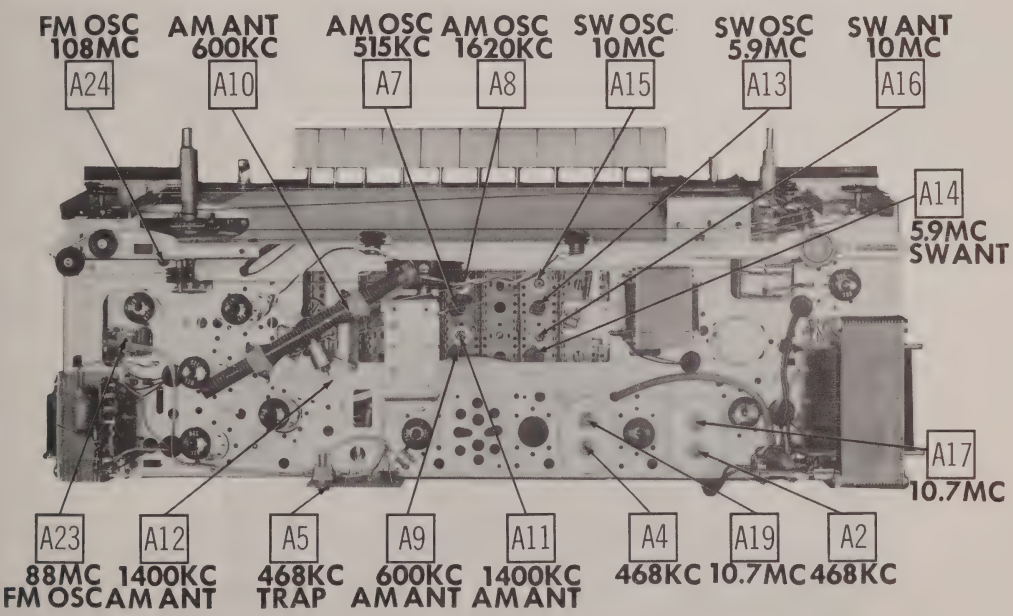
NAME	PART NO.	DESCRIPTION
Dial	920-6	
Knob	920-8	Small
Knob	920-9	Medium
Knob	920-10	Large
Knob	920-11	Tone
Pushbutton	920-12	Function Selectors
Pushbutton	920-13	Tone
Cabinet	920-1	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors; 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-5 (5 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

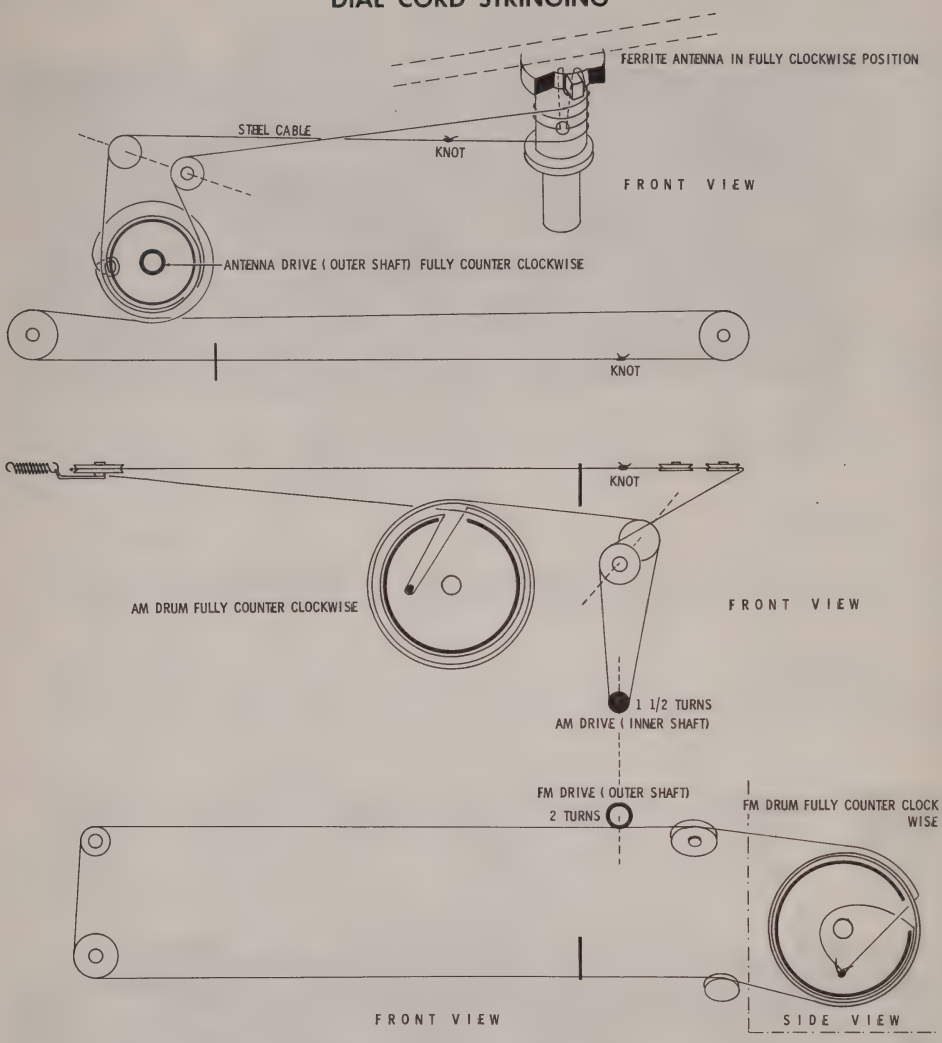


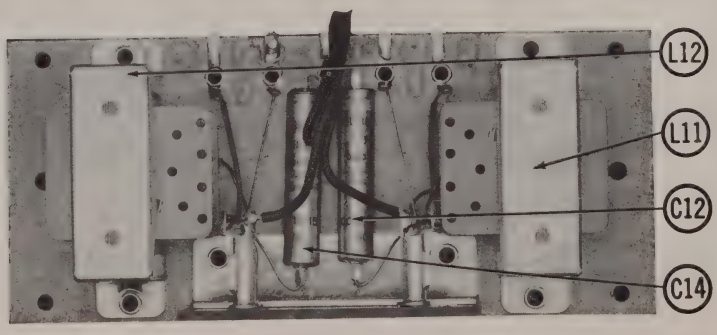
CHASSIS BOTTOM VIEW-ALIGN. & INDUCTOR IDENT.



CHASSIS TOP VIEW-ALIGNMENT IDENT.

DIAL CORD STRINGING





SPEAKER CROSSOVER BOARD

PHOTOFACT® Folder with CIRCUITRACE®

GELOSO MODEL
G-258

GELOSO MODEL
G-258

GENERAL INFORMATION

The Geloso Model G258 is a three-speed, dual-track tape recorder.

Recordings can be made directly from a microphone, radio, phonograph, or television receiver.

The three tape speeds are 15/16, 1 7/8, and 3 3/4 ips. The recording or playback time using both tracks are as follows:

Reel Size	15/16 ips.	1 7/8 ips	3 3/4 ips
3" (300 ft.)	2 hours	1 hour	1/2 hour
5" (600 ft.)	4 hours	2 hours	1 hour

Connect recorder to an outlet supplying 110-120 volts, 60 cycles AC only.

Supplied By:

American Geloso Electronics, Inc.
251 Fourth Avenue
New York 10, N.Y.

SET 561 FOLDER 9

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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CQ474

FUNCTION OF CONTROLS

On-Off

Moving this control toward the front of the recorder turns the power on; toward the rear, turns the power off.

Fast Forward

Moving this control to the left will rapidly advance the tape to any desired section in a few seconds.

Volume

Rotating this control clockwise will increase the volume; counterclockwise, will decrease the volume.

Tone

Rotating this control clockwise will increase the treble; counterclockwise will increase the bass.

Rewind

Depressing this button will rapidly rewind the tape onto the supply reel.

Playback

Depressing this button places the recorder in the playback mode.

Stop

This button, when depressed, stops the transport mechanism and mutes the amplifier.

Record

When this button is depressed, the recorder is in the record mode.

OPERATING INSTRUCTIONS

Threading the Tape

1. Place a reel of tape on the left spindle and an empty reel on the right spindle. Make sure the reels slip down on the guide ledges of the spindle.
2. Push the Fast Forward lever to the left.
3. Thread the tape into the slot between the head and the head pads.
4. Insert the loose end of the tape into one of the radial slots of the take-up reel. Turn the reel several turns counterclockwise to secure the tape to the reel.

To Record from a Microphone

1. Insert the microphone plug into the Microphone Input jack.
2. Depress the Stop button.
3. Thread the tape.
4. Set the tape counter to zero.
5. Turn the recorder on and let the tubes warm up.
6. Depress the Record button.
7. Hold the microphone six to eight inches from the mouth and speak in a normal voice.
8. If the bands on the record level indicator do not flicker, the recording level (volume control) setting is too low. If the bands overlap, the recording level is too high and will cause distortion during playback. A test recording should be made to determine correct recording level.

To Record from a Radio or Television Receiver

Recordings may be made from a radio or television receiver by placing the microphone near the speaker. Recordings may also be made by connecting a shielded cable with two alligator clips on one end and a phone plug on the other. Connect the alligator clips across speaker voice coil, and insert the plug into the microphone input jack. Proceed as described under "To Record from a Microphone".

To Record from a Phonograph

Connect the pickup leads to the microphone input jack and record as described under "To Record from a Microphone".

Dual-Track Recording

1. Thread the tape, and make a recording.
2. After the recorded tape has been wound onto the take-up reel, depress the Stop button.
3. Remove the reels from the spindles. Turn the full reel over and place it on the left reel spindle. Place the empty reel on the right reel spindle.
4. Rethread the tape.
5. After the second track has been recorded, the first track can now be played without rewinding the tape.

To Play a Recording

1. Thread the tape.
2. Turn the recorder on. Allow sufficient time for the unit to warm up.
3. Depress the Play button.
4. Adjust the Volume and Tone controls to the desired listening level.

Fast Forward and Rewind

High-speed forward can be obtained by pushing the Fast Forward lever to the left. For fast rewind, depress the Rewind pushbutton.

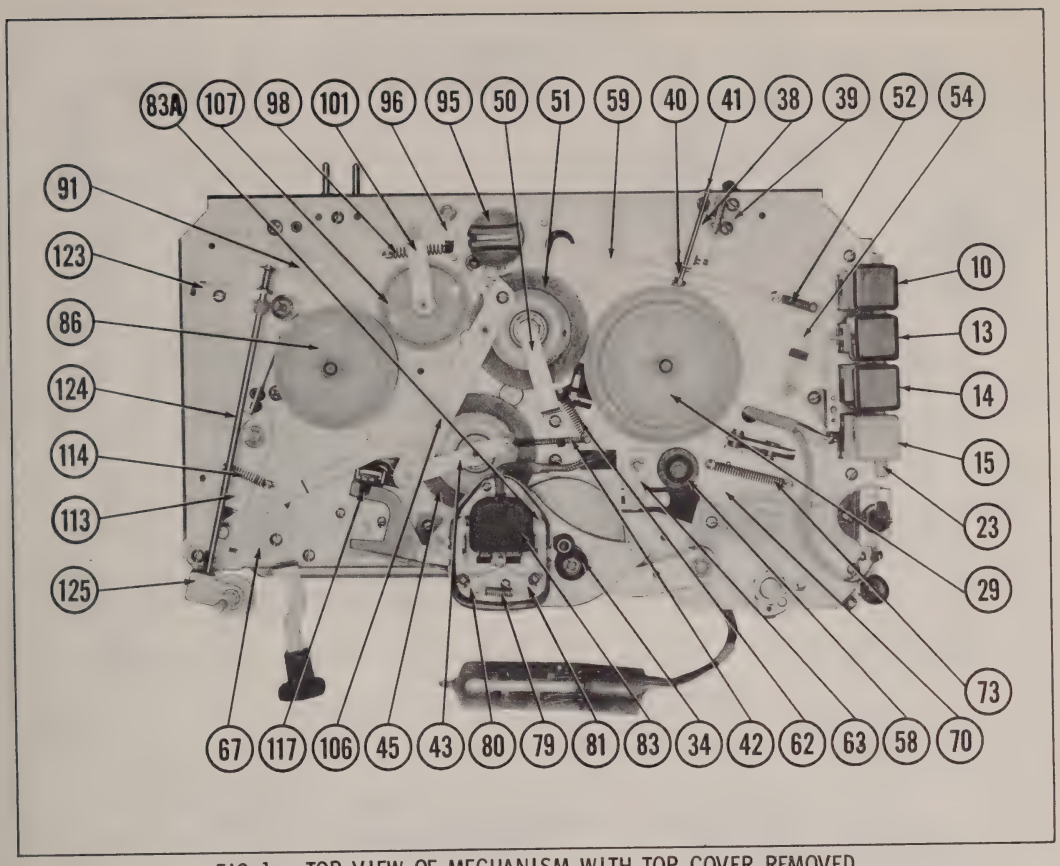


FIG.1 TOP VIEW OF MECHANISM WITH TOP COVER REMOVED

Erasing Recorded Material

Recorded material is automatically erased when new material is recorded. If a portion of a recorded tape or an entire reel of tape is to be erased without recording new material, proceed as follows:

1. Thread the tape.
2. Do not connect microphone or other signal source; or turn volume to minimum.
3. Turn unit on and allow time for warmup.
4. Depress the Record button. The recorded material will be erased. Stop the process by depressing the Stop button.

NOTE: Only one track of recorded material is erased at a time. To erase the second track, reverse the reels and repeat the foregoing procedure.

To Edit and Splice Tape

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings to be edited should be limited to one track tapes only.

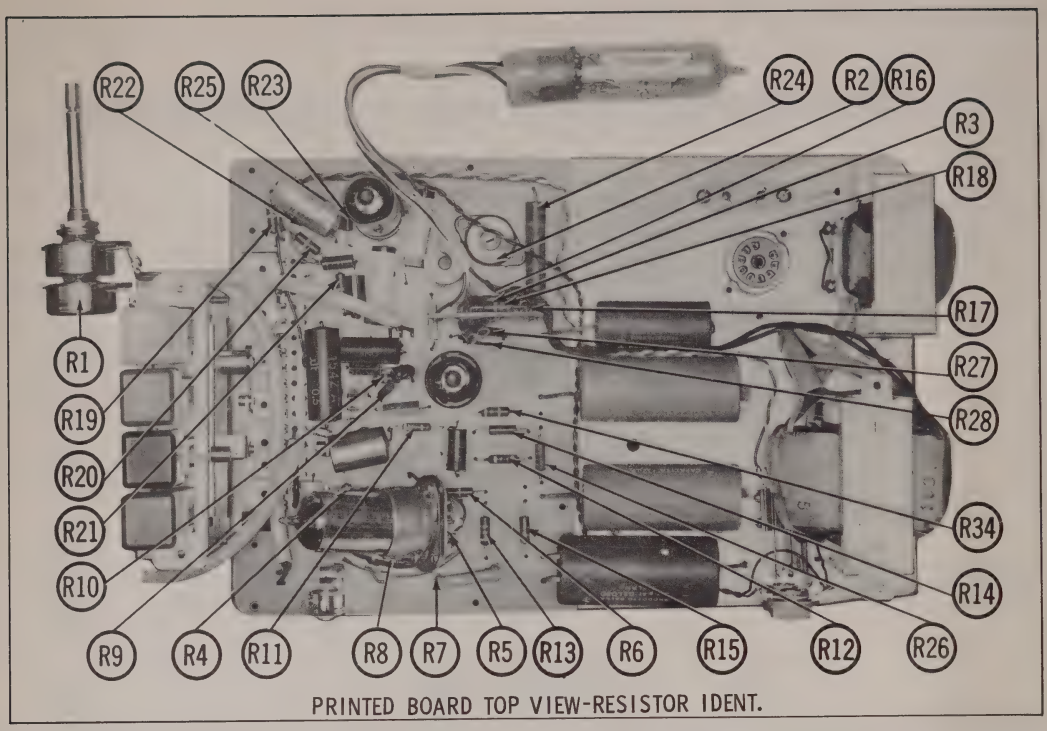
1. The tape can be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements, etc., can be inserted between selections. Unused sections of tape may be spliced and re-used.
2. For best results, overlap the broken ends and cut them at a 45^{o} angle. Join the ends with splicing tape on the glossy side and trim off any excess width.

External Speaker Jack

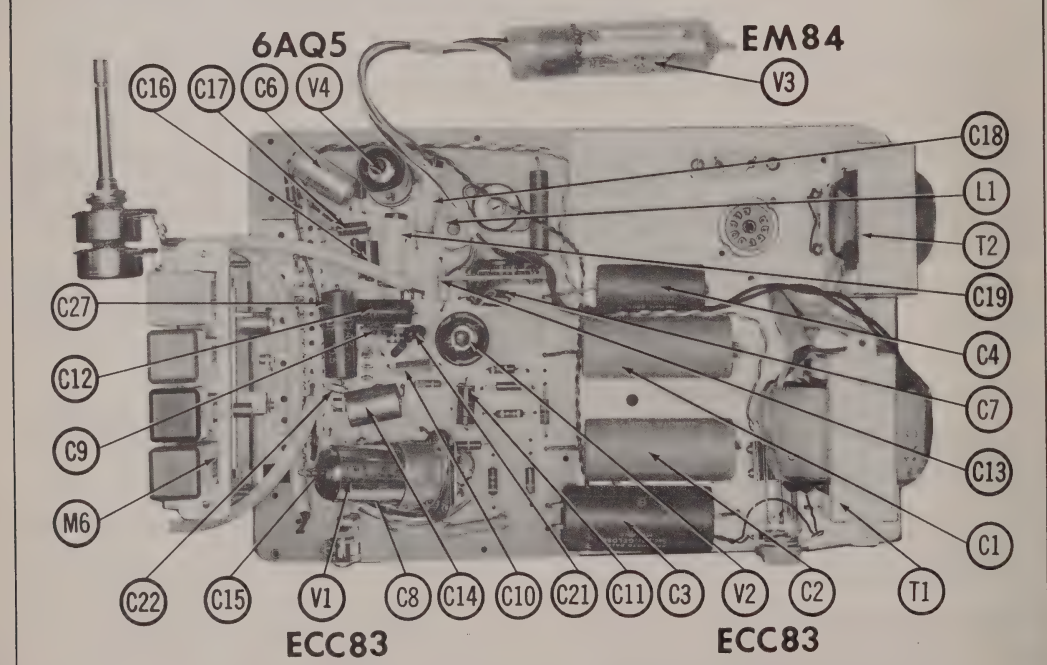
An external speaker can be used with the recorder by connecting it to the external speaker jack.

Monitor

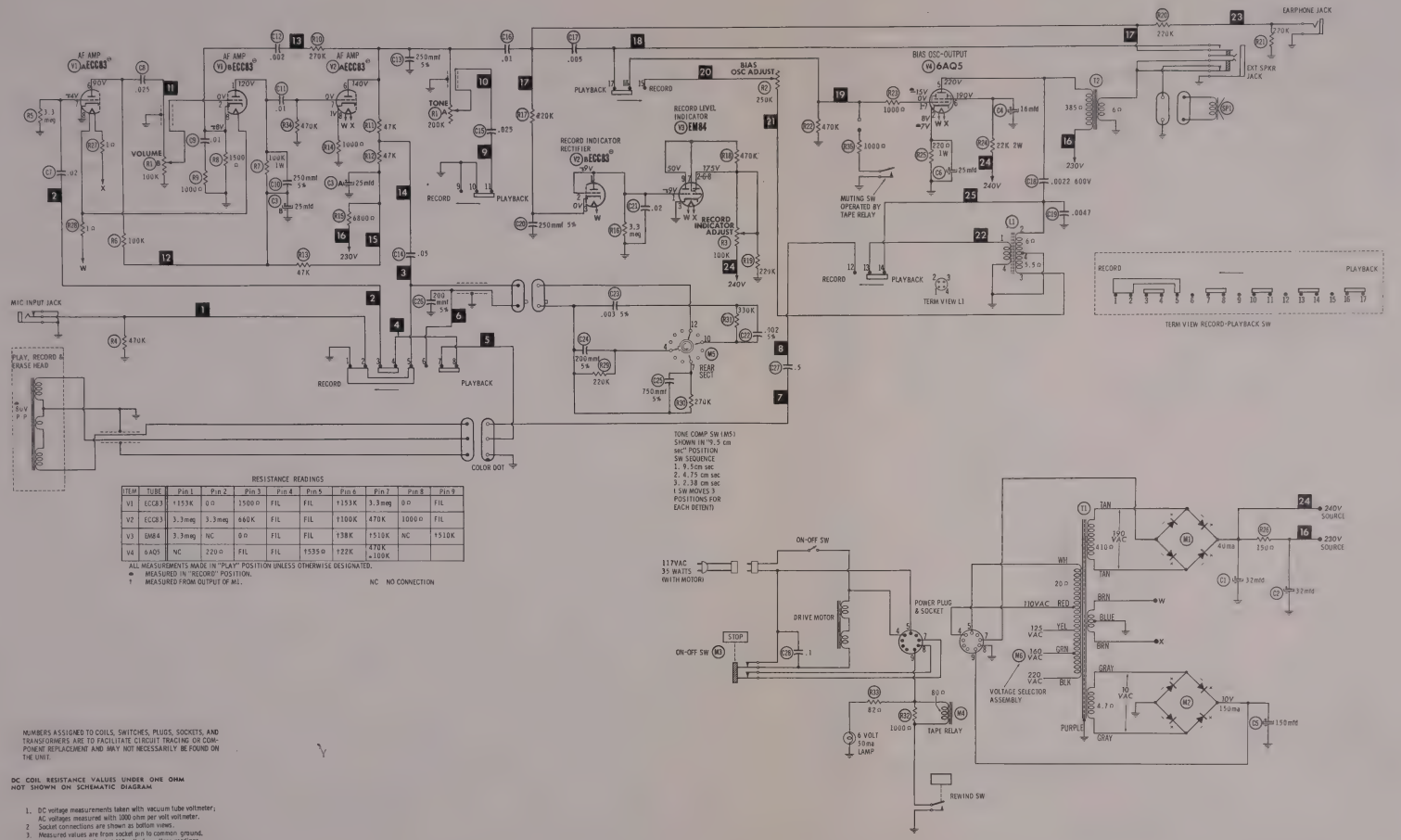
Recordings may be monitored by connecting an earphone to the monitor jack.



PRINTED BOARD TOP VIEW-RESISTOR IDENT.



PRINTED BOARD TOP VIEW-CAPACITOR, INDUCTOR, TUBE & MISC IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83	†153K	0Ω	1500Ω	FIL	FIL	†153K	3.3meg	0Ω	FIL
V2	ECC83	3.3meg	3.3meg	660K	FIL	FIL	†100K	470K	1000Ω	FIL
V3	EM84	3.3meg	NC	0Ω	FIL	FIL	†38K	†510K	NC	†510K
V4	6AQ5	NC	220Ω	FIL	FIL	†535Ω	†22K	470K ±100K		

ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "RECORD" POSITION.
† MEASURED FROM OUTPUT OF M1.

NC NO CONNECTION

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE
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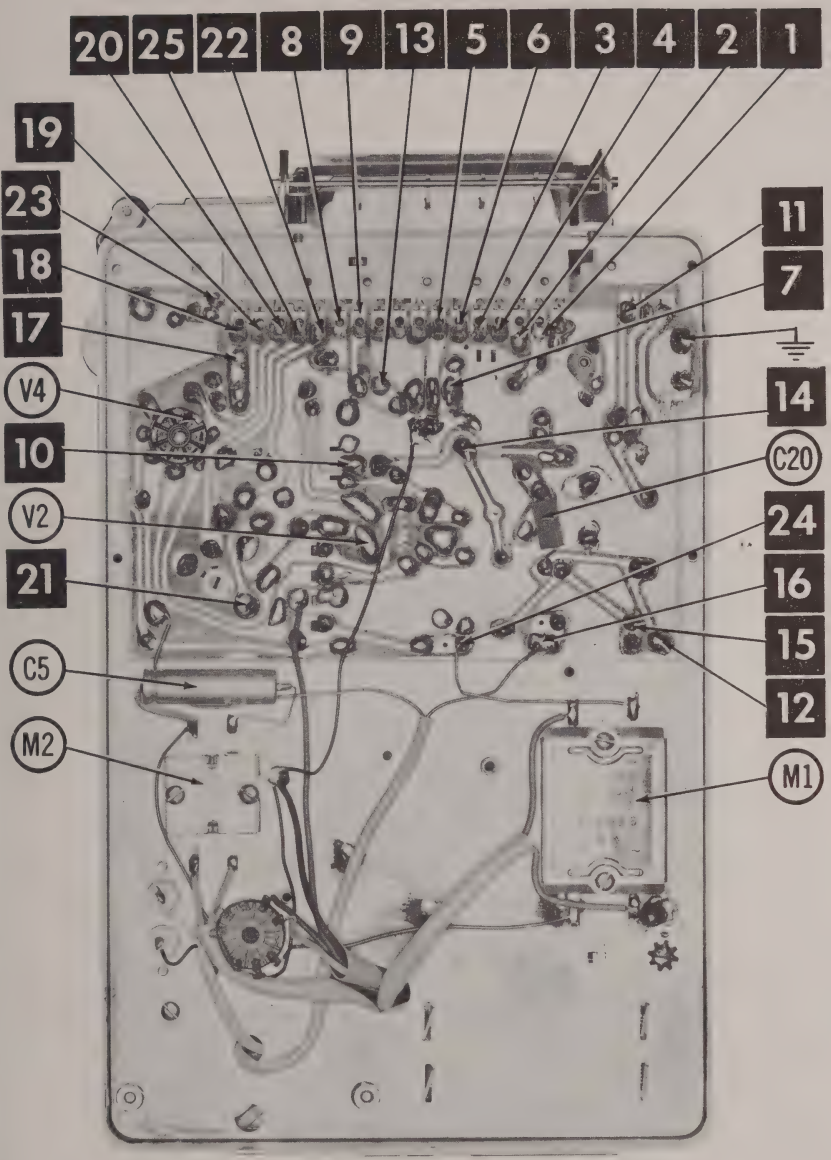
GELOSO MODEL G-258



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

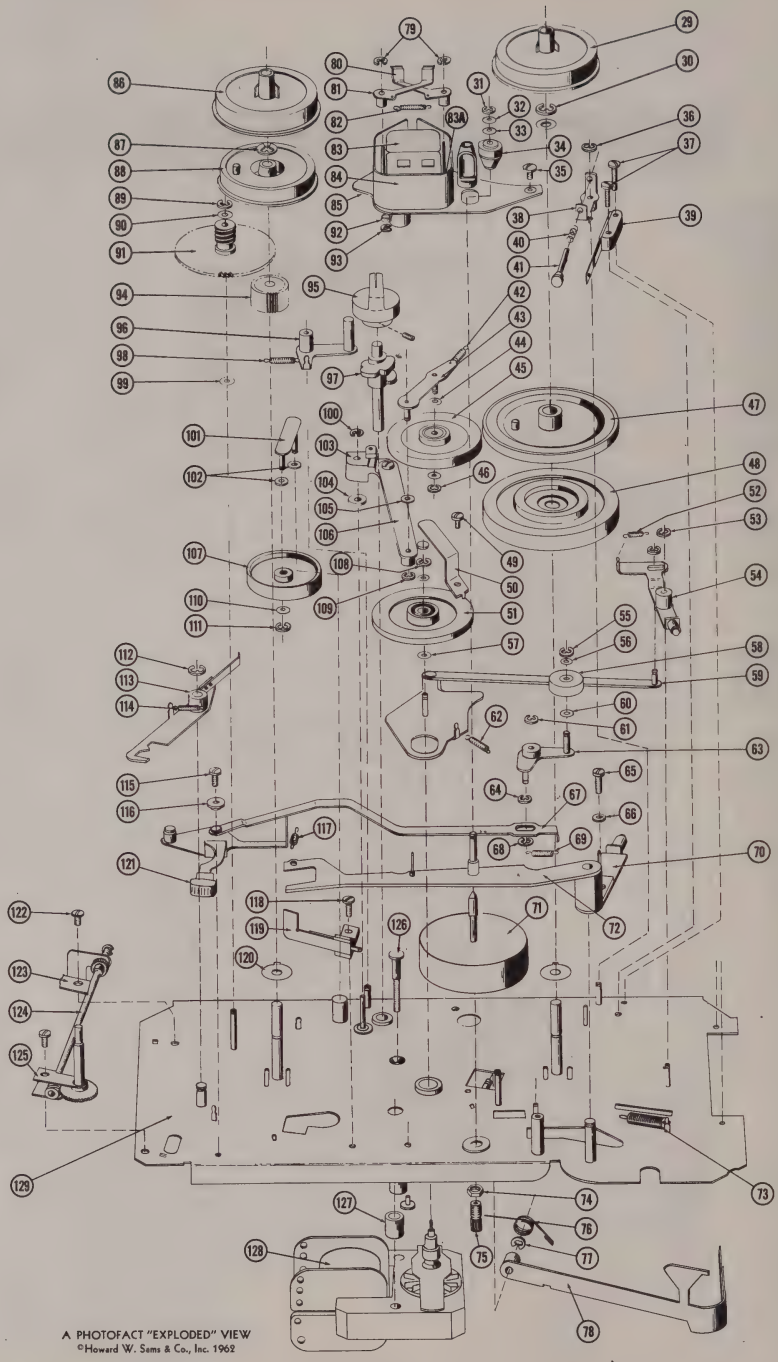


FIG. 2A EXPLODED VIEW OF MECHANISM

DISASSEMBLY

To Remove Tape Recorder from Cabinet

1. Remove three screws holding escutcheon (4).
2. Remove escutcheon (4).
3. Remove tape pointer index knob (9), volume control knob (6), and tone control knob (7).
4. Remove six screws holding cabinet top (5) to transport.
5. Turn case over and remove five screws holding bottom of cabinet.
6. Lift off cabinet bottom.
7. Lift off rear portion of cabinet.
8. Lift off front portion of cabinet far enough to unplug speaker plug. Lift away from transport.
9. Lift transport straight up and away from cabinet top (5).

To Remove the Amplifier from the Tape Transport

1. Remove the two screws holding the tape transport to the power transformer.
2. Remove the two screws below the push-button assembly.
3. Unplug speaker and head connections.
4. Lift the transport from the amplifier far enough to unplug the remaining connections.

CLEANING

Recording head (83), pressure roller (34), and the capstan shaft may accumulate tape coating residue, which is worn off the tape as it passes these parts. Clean them with a soft cloth and alcohol.

CAUTION: Never clean the magnetic head with carbon tetrachloride.

LUBRICATION

Apply one drop of oil to the following parts if they have been replaced or removed for repair:

1. Geared tape counter assembly (124).
2. Geared counter wheel (91).
3. Locknut of reverse wheel (88).
4. Idler wheels (45) and (51).
5. Fast forward wheel (58).
6. Locknut of cork friction disc (48).
7. Pressure roller (34).
8. Fast forward lever (67).
9. Bearing of fast forward pulley lever (63).
10. Pad actuating lever (72).

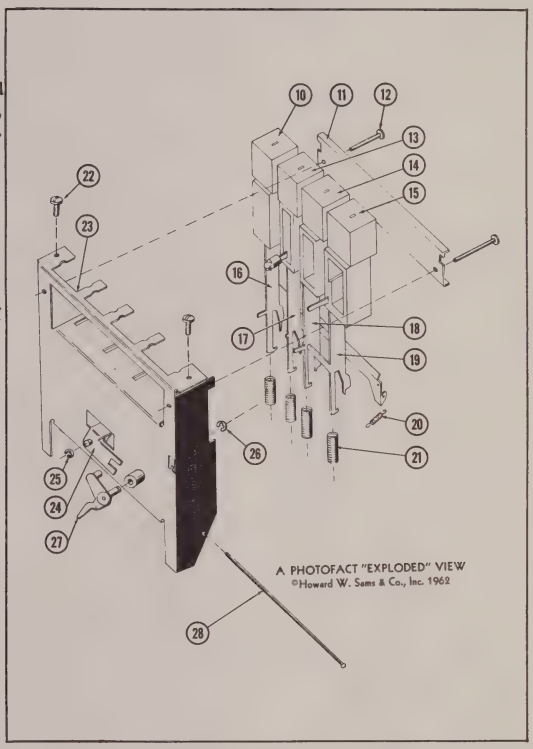


FIG. 2B EXPLODED VIEW OF PUSHBUTTON ASSY.

ADJUSTMENTS

Flywheel

1. Loosen flywheel bearing locknut (74).
2. Loosen or tighten flywheel bearing screw (75), until flywheel turns freely.
3. Retighten locknut (74).

Take-Up Tension

1. Place an empty 7" reel on the take-up spindle.
2. Attach a short loop of string to the outside edge of the reel.
3. Connect a gram scale to the end of the string and depress the play button.

4. The take-up tension should be between 4.8 and 7.2 grams.

5. If take-up tension is not as specified, remove reel boffin (29).

6. Remove "E" ring (30), washer, and friction disc (47).

7. Clean the cork friction disc (48) thoroughly. Moisten it with a drop of oil, spreading the oil over the entire surface of the cork.

8. Reassemble the clutch, and recheck the take-up tension.

Fast Forward

1. Connect a gram scale as described under steps 1, 2 and 3 of Take-up Tension.

2. Move the Fast Forward lever to the left.

3. The tension should read 15 grams on a gram scale.

4. If traction is less than 15 grams, check rapid advance wheel (58) to see that it runs freely. If it does not, clean with alcohol.

5. Make sure cork friction disc (48) and friction disc (47) are securely friction-joined.

Rewind Stop

1. Depress the Stop Button.

2. Loosen screw (65) to permit pad actuating lever (72) to move freely.

3. There must be a clearance of 1/64 inch between the pressure roller (34) and the capstan.

4. After securing the required clearance (See Step 3), tighten screw (65).

Head Alignment

1. Connect a voltmeter to the output jack.

2. Thread a prerecorded 5,000-cycle note tape onto the recorder.

3. Place the recorder in the Playback mode.

4. Set the Volume control to its midrange.

5. Adjust screw (83A) for maximum reading on the meter.

NOTE: If the speaker is disconnected, connect a 3.2-ohm, 2 watt resistor between the output jack and the voltmeter.

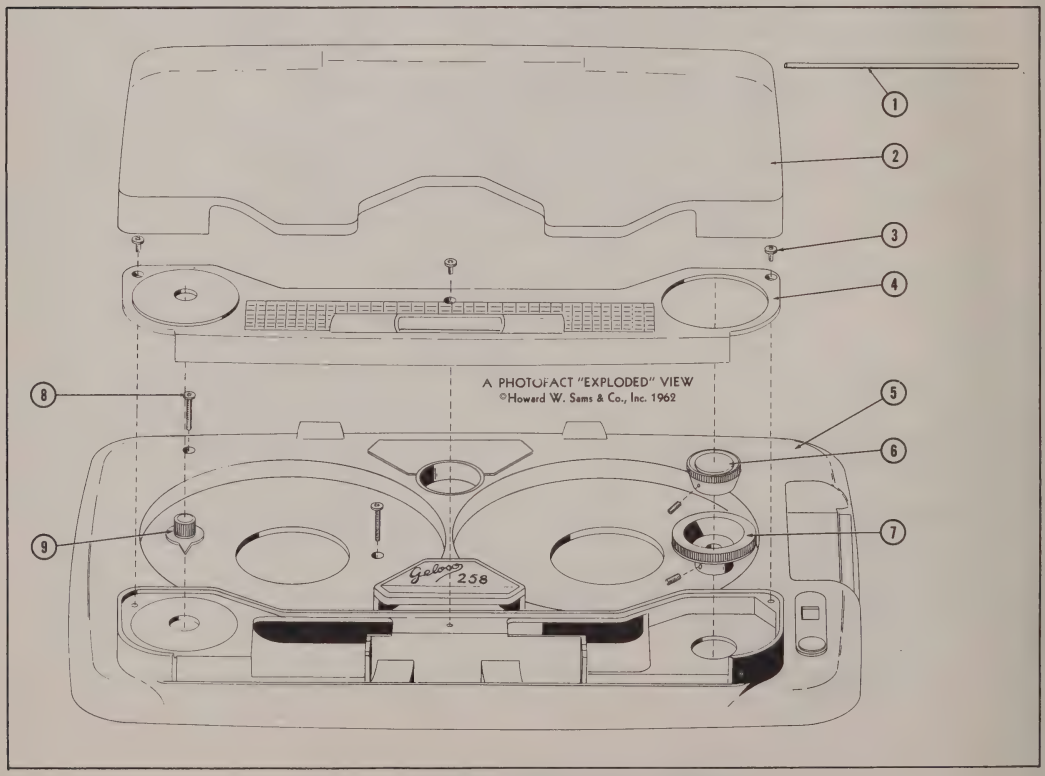


FIG. 2C EXPLODED VIEW OF TOP ASSEMBLY

TROUBLE CHART

Symptom	Cause	Remedy
No rewind.	1. Tension spring (52) or (62) broken or disconnected.	1. Connect or replace tension springs (52)or (62).
No record or playback.	1. Play-record-erase head (83) defective. 2. Tension spring (73) broken or disconnected.	1. Replace play-record-erase head (83). 2. Connect or replace tension spring (73).
No erase.	1. Play-record-erase head (83) defective. 2. Play-record-erase head (83) positioned wrong.	1. Replace play-record-erase head (83). 2. Position head (83) so it is parallel with the tape when in record position.
Flywheel binds.	1. Flywheel bearing screw (75) too tight.	1. Loosen flywheel bearing locknut (74) and adjust flywheel bearing screw (75) until the flywheel runs freely with no clearance. Tighten locknut (74).

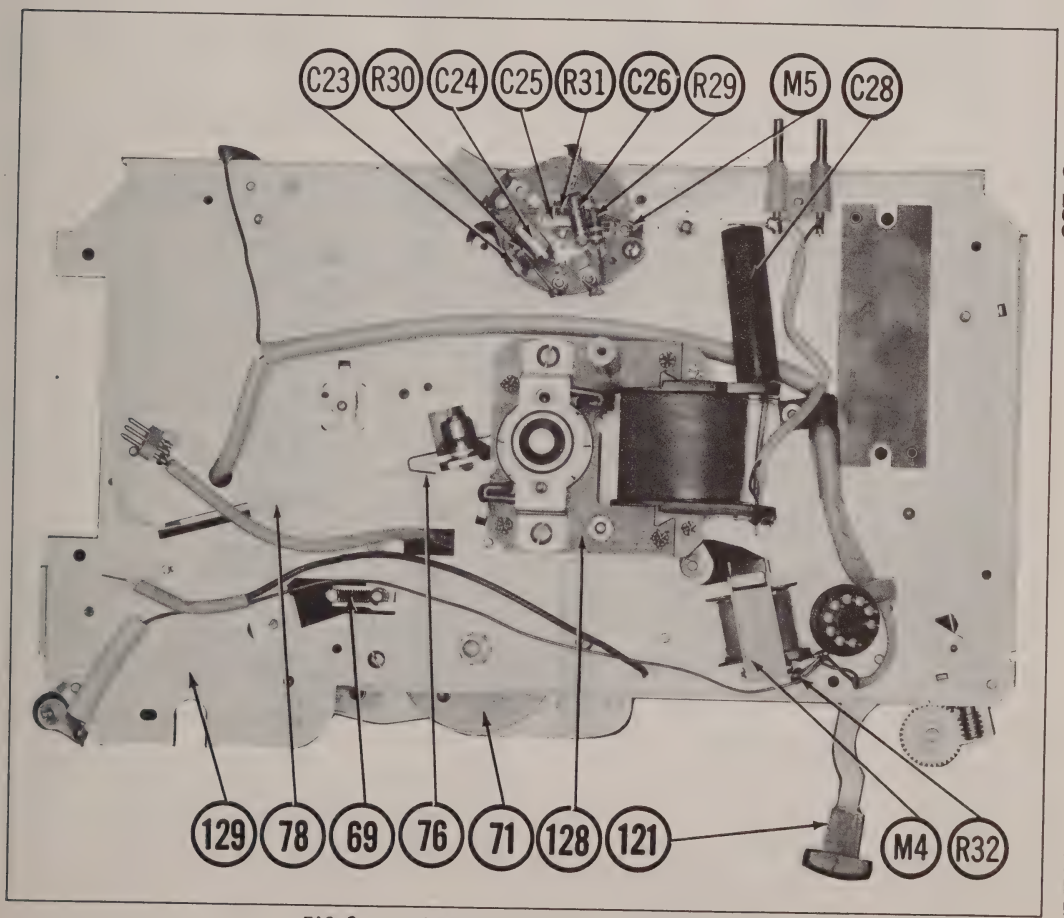


FIG.3 MECHANICAL CHASSIS-BOTTOM VIEW

Ref. No.	Part No.	Description
1	258/219	Hinge Pin
2	258/216	Transparent Cover
3	258/357	Screw
4	258/21c	Escutcheon
5	258/21a	Cabinet Top
6	258/28	Volume Control Knob
7	258/235	Tone Control Knob
8	258/355	Screw
9	258/237	Tape Counter Knob
10	258/224	Record Button (Red)
11	258/218	Bracket
12	258/348	Screw
13	258/225	Stop Button (Black)
14	258/226	Play Button (Green)
15	258/227	Rewind Button (Yellow)
16	258/222	Pushbutton Lever (Record)
17	258/220	Pushbutton Lever (Stop)
18	258/221	Pushbutton Lever (Play)
19	258/223	Pushbutton Lever (Rewind)
20	258/291	Spring
21	258/292	Spring
22	258/346	Screw
23	258/93	Pushbutton Bracket
24	258/94	Switch Intermediate Lever
25	258/305	"E" Ring
26	258/305	"E" Ring
27	258/92	Switch Command Lever
28		Latch Pin (Pushbutton)
29	258/210	Reel Boffin
30	258/306	"E" Ring
31	258/305	"E" Ring
32	258/322	Washer
33	258/322	Washer
34	258/267	Pressure Roller
35	258/180	Screw
36	258/305	"E" Ring
37	258/352	Screw
38	258/86	Contact Support Bracket
39	258/215	Switch
40	258/288	Spring (Type L)
41	258/127	Pivot for Washer Holder
42	258/290	Spring (Type L)
43	258/88	Pulley Support Lever
44	258/322	Washer
45	258/300	Idler Wheel
46	258/305	"E" Ring
47	258/213	Friction Disc
48	258/212	Cork Friction Disc
49	258/346	Screw
50	258/49	Idler Wheel Support
51	258/300	Idler Wheel
52	258/287	Spring (Type M)
53	258/305	"E" Ring
54	258/83	Rewind Intermediate Lever
55	258/305	"E" Ring
56	258/322	Washer
*57	258/322	Washer
58	258/266	Fast Forward Wheel
59	258/70	Rewind Pulley Lever
60	258/322	Washer
61	258/305	"E" Ring
62	258/280	Spring (Type G)
63	258/76	Fast Forward Pulley Lever
64	258/305	"E" Ring
65	258/346	Screw
66	258/52	Washer - 7 x 3, 5 x 1
67	258/78	Fast Forward Lever
68	258/305	"E" Ring
69	258/282	Spring (Type I)
70	258/82	Intermediate Lever
71	258/131	Flywheel
72	258/81	Pad Actuating Lever
73	258/284	Spring (Type N)
74	258/166	Flywheel Bearing Locknut
75	258/133	Flywheel Bearing Screw
76	258/286	Spring (Type H)
77	258/306	"E" Ring
78	258/84	Rewind Command Lever
79	258/305	"E" Ring
80	258/98	Erase Head Pad
81	258/99	Record Head Pad
82	258/293	Spring (Type E)
83	258/500	Head Ass'y., Complete with Plug
84	258/97	Head Assembly Compartment
85	258/96	Head Assembly Plate
86	258/210	Reel Boffin
87	258/306	"E" Ring
88	258/211	Take-off Reel Holder
89	258/305	"E" Ring
90	258/322	Washer
91	258/334	Tape Counter Drive Gear
92	258/294	Spring (Type 1142)
93	258/305	"E" Ring
94	258/250	Worm Pinion
95	258/236	Speed Change Knob
96	258/89	Speed Change Lever
97	258/216	Speed Change
98	258/289	Spring (Type D)
99	258/322	Washer
100	258/307	"E" Ring
101	258/90	Intermediate Pulley Lever
102	258/322	Washer
103	258/302	Speed Change Lever
104		Washer
105	258/322	Washer
106		Speed Change Lever Arm
107	258/217	Idler Pulley
108	258/305	"E" Ring
109	258/305	"E" Ring
110	258/322	Washer
111	258/305	"E" Ring
112	258/305	"E" Ring
113		Brake Lever
114	258/283	Spring (Type A)
115	258/346	Screw
116	258/202	Retainer
117	258/285	Spring (Type C)
118	258/348	Screw
119	258/219	Silent Blade Support
120	258/73	Washer
121	258/234	Fast Forward Knob
122	258/346	Screw
123		Tape Counter Bracket
124	258/122	Tape Counter Pivot Rod
125		Tape Counter Bracket
126	258/189	Motor Mounting Screws
127	258/188	Motor Mounting Spacers
128	258/34	Motor

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	ECC83 (12AX7)*	V3	Record Level Indicator	EM84
V2	AF Amp. -Record Indicator Rectifier	ECC83 (12AX7)*	V4	Bias Osc. -Output	6AQ5

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GELOSO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	32	350	258/10	PRS1660	BR3035	QT1-14	TC77	TD-30-350	TVA-1610
C2	32	350	258/10	PRS1660	BR3035	QT1-14	TC77	TD-30-350	TVA-1610
C3A	25	350	258/11	PRS2400	BBRD3345	QT2-8	TCD65	TDLD-29	TVA-2735
B	25	350							
C4	16	250	258/12	PRS1565	BR1625	QT1-8	TC54	TD-16-250	TVA-1507
C5	150	15	258/13		NLW150-15	MT1-23		MLV150-15	TE-1163
C6	25	30	258/36	PTT95	NLW25-50	MT1-12	TC36	MLV25-50	TE-1306

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C8	.025 350V		P488N-025		DPMS8S25	4DP-2-253	GEM-4125	4TM-S25
C9	.01 150V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C10	250 5%		1469-00025	TCZ-240	22R5T25	CM-19B-251J	MCE240	MS-325
C11	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C12	.002 400V		P488N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C13	250 5%		1469-00025	TCZ-240	22R5T25	CM-19B-251J	MCE240	MS-325
C14	.05 350V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C15	.025 350V		P488N-025		DPMS8S25	4DP-2-253	GEM-4125	4TM-S25
C16	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C17	.005 150V		P288N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C18	.0022 600V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C19	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C20	250 5%		1469-00025	TCZ-240	22R5T25	CM-19B-251J	MCE240	MS-325
C21	.02 150V		P288N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C22	.002 5%				5R5D2	CM-19B-202J	MCE457	MS-22
C23	.003 5%				1R5D3	CM-19B-302J	MCE461	MS-23
C24	200 5%			TCZ-200	22R5T2	CM-19B-201J	MCE237	MS-32
C25	750 5%				5R5T75	CM-19B-751J		MS-375
C26	200 5%			TCZ-200	22R5T2	CM-19B-201J	MCE237	MS-32
C27	.5 150V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5
C28	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GELOSO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	200K	½	258/436					Tone
B	100K	½						Volume
R2	250K	½	258/446					Bias Osc. Adj.
R3	100K	½	258/435					Record Indicator Adj.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	470K				R20	220K			
R5	3.3meg				R21	220K			
R6	100K				R22	470K			
R7	100K 1W				R23	1000Ω			
R8	1500Ω				R24	22K 2W			
R9	1000Ω				R25	220Ω 1W			
R10	270K				R26	150Ω			
R11	47K				R27	1Ω			
R12	47K				R28	1Ω			
R13	47K				R29	220K			
R14	1000Ω				R30	270K			
R15	6800Ω				R31	330K			
R16	3.3meg				R32	1000Ω			
R17	220K				R33	82Ω			
R18	470K				R34	470K			
R19	220K				R35	1000Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		GELOSO PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Oscillator	258/3					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	GELOSO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	220V, 160V, 125V, 110V, 117V @ .25A (110V Tap)	190VCT @ .070A AC	6.3VCT @ 1.3A	258/1					
	SEC. 3								
	10V @ .170A AC								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	GELOSO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7800Ω	3-4Ω	258/2	A-3020①	A-3823①	26848①	S-7X①	① Drill New Mounting Hole(s).

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	GELOSO PART No.	QUAM PART No.	
SP1	4"x 7"	PM	3-4Ω	258/6		

ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	GELOSO PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.040A	258/4 †	1N1763 ‡	2F4 ‡	† Bridge Type Selenium
M2	.150A	258/5 †	1N1763 ‡	F6 ‡	‡ Silicon Type, 4 Required

MISCELLANEOUS

ITEM No.	PART NAME	GELOSO PART No.	NOTES
M3	Switch	258/37	Power Off-On
M4	Relay	258/14	
M5	Switch	258/33	Wafer, Tone Comp.
M6	Switch Ass'y.	258/326	AC Voltage Input Selector
	Printed Board	258/324	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	258/28	Volume
Knob	258/235	Tone
Knob	258/236	Speed Change
Knob	258/237	T. P. I. Indicator
Pushbutton Cap	258/224	Record, Red
Pushbutton Cap	258/225	Stop, Black
Pushbutton Cap	258/226	Play, Green
Pushbutton Cap	258/227	Rewind, Yellow
Lever	258/234	Fast, Forward
Cabinet	258/21	Complete

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

**HARPERS MODEL
GK-501**

HARPERS MODEL
GK-501

HARPERS MODEL
GK-501

TRADE NAME	Harpers Model GK-501
IMPORTER	Harpers International, Inc., 315 Fifth Ave., New York 16, N. Y.
TYPE SET	Battery Operated 4 Tube Portable AM Receiver
POWER SUPPLY	1.5 Volts DC "A" Supply & 67.5 Volts DC "B" Supply RATING 250MA@1.5 Volts DC & 12MA@ 67.5 Volts DC
TUNING RANGE—BROADCAST	540 — 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: GENERAL CEMENT #8721, 8722
WALSCO #2519

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	"	600KC	600KC	"	A4	"

SET 561 FOLDER 10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1962 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF899

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE			
	◆ GENERAL ELECTRIC ◆		◆ RAYTHEON ◆	◆ SYLVANIA ◆	
V1	Converter	1R5	V3	Det.-AVC-AF Amplifier	1S5
V2	IF Amplifier	1T4	V4	Output	3S4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	HARPERS PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	10	100		PRS1410	BBR10-150	QT1-5	TC42	TD-10-150	TVA-1406

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2A	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
B	250		DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C	250		DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C3	100		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C4A	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
B	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C5	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	200		DI-200	DD-201	L10T2	CCD-201	GP320	10TS-T20
C7	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C8	250		1468-00025	TCZ-240	22R5T25	CM-19B-251M	MC240	1FM-325

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HARPERS PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	1meg	½		B16-220				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

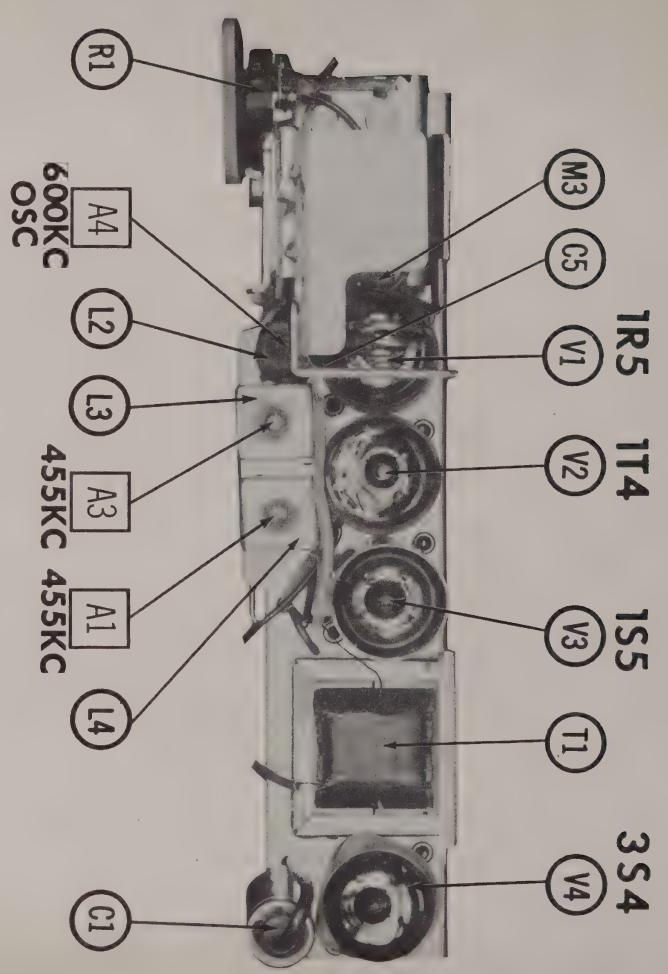
ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R2	100K			
R3	2.2meg			
R4	10K			
R5	10meg			
R6	1meg			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R7	220K			
R8	1meg			
R9	500Ω			
R10	2.2meg			
R11	470K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		HARPERS PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick						
L2	Osc.						
L3	Input IF						
L4	Output IF						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	HARPERS PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2000Ω	10-12Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HARPERS PART No.	QUAM PART No.	
SP1	2½"	PM	10-12Ω		25A07Z12	

BATTERIES

ITEM No.	VOLTAGE	HARPERS PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1 M2	1.5V 67.5V		130	UX45	635	416	M-14R	M-217	

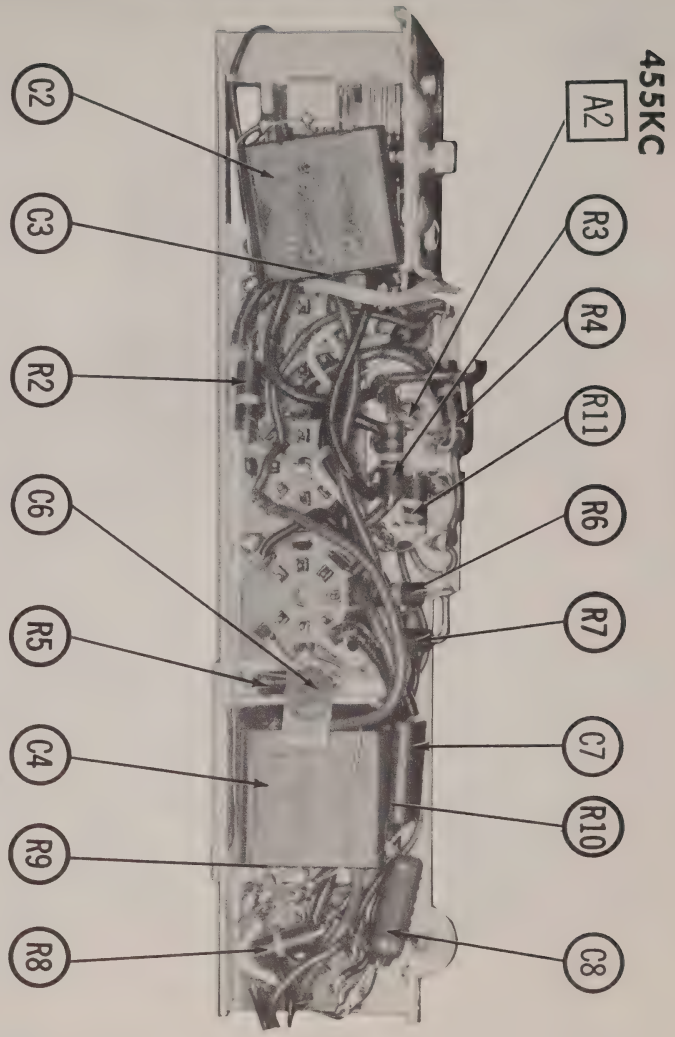
MISCELLANEOUS

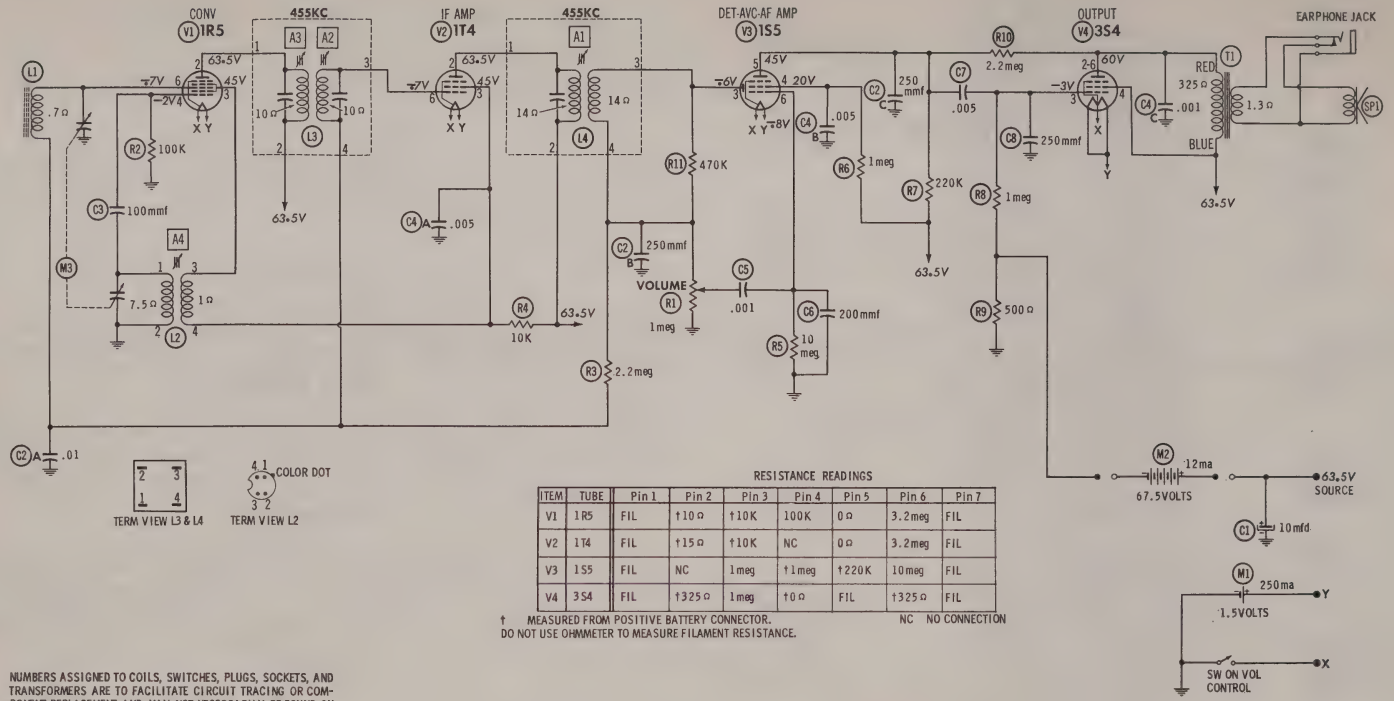
ITEM No.	PART NAME	HARPERS PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	FIL	†10Ω	†10K	100K	0Ω	3.2meg	FIL
V2	1T4	FIL	†15Ω	†10K	NC	0Ω	3.2meg	FIL
V3	1S5	FIL	NC	1meg	†1meg	†220K	10meg	FIL
V4	3S4	FIL	†325Ω	1meg	†0Ω	FIL	†325Ω	FIL

† MEASURED FROM POSITIVE BATTERY CONNECTOR. NC NO CONNECTION
DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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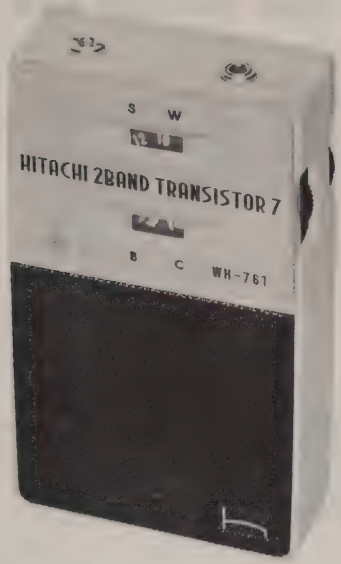
HARPERS MODEL GK-501

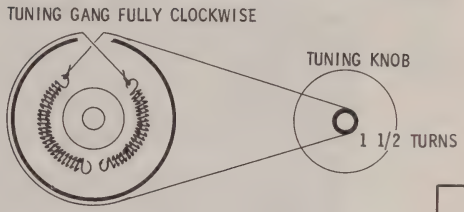
PHOTOFACT® Folder with CIRCUITRACE®

HITACHI MODEL WH-761SB

HITACHI MODEL
WH-761SB



DRIVE CORD STRINGING



FRONT VIEW

TRADE NAME	Hitachi Model WH-761SB		
IMPORTER	Electronic Utilities Co., Div. of the Sampson Co., 2244 S. Western Ave., Chicago 8, Illinois		
TYPE SET	Battery Operated Transistorized Portable BC-SW Receiver		
POWER SUPPLY	9 Volts DC	RATING	5MA @ 9 Volts DC (No Signal, Min. Volume) 12MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540—1600KC	SHORT WAVE	3.8 — 12MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1, A2, A3, A5..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A4, A6, A8, A9..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

A10, A11..... GENERAL CEMENT #9440

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	"
5.	"	600KC	600KC Signal.	"	A7	Adjust for maximum output by moving coil turns along ferrite core.
6.	High side thru .001mfd to external antenna connection.	12MC	(SW) 12MC	"	A8, A9	Adjust for maximum output.
7.	"	4MC	4MC	"	A10, A11	Adjust for maximum output. Repeat Steps 2 thru 7.

HITACHI MODEL
WH-761SB

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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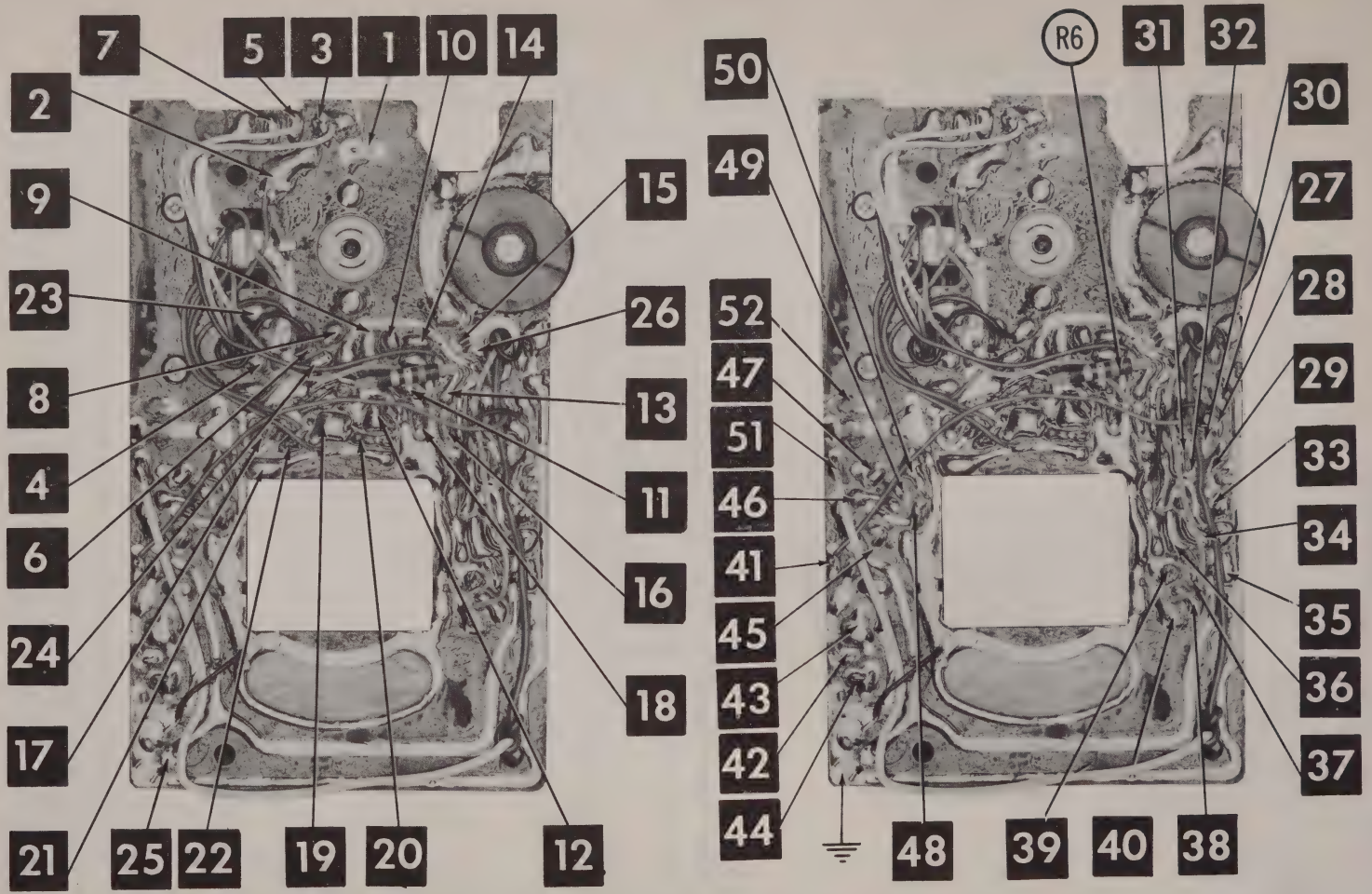
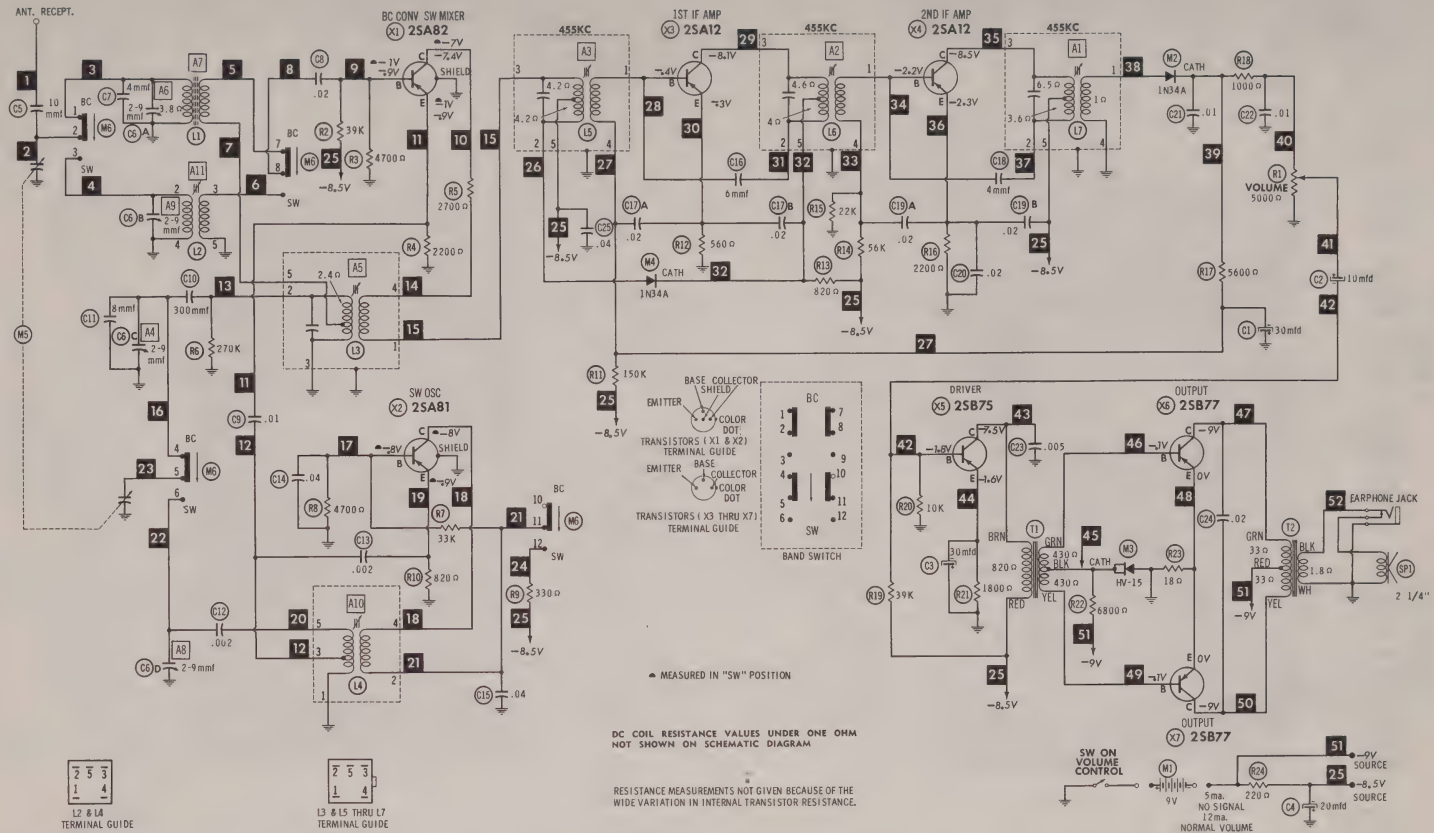
SET 561 FOLDER 11



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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HITACHI MODEL WH-761SB

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2SA82	BC Conv. -SW Mixer	2N370		PNP
X2	2SA81	SW Oscillator	2N371		PNP
X3	2SA12	1st IF Amplifier	2N410		PNP
X4	2SA12	2nd IF Amplifier	2N410		PNP
X5	2SB75	Driver	2N406		PNP
X6	2SB77	Output	2N408		PNP
X7	2SB77	Output	2N408		PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	HITACHI PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	30	3			NLW30-6	MT1-13			
C2	10	3			NLW10-6	MT1-5			TE-1053
C3	30	3			NLW30-6	MT1-13			
C4	20	10		BCD10025	NLW20-15	MT1-10			

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C6A	2-9							
B	2-9							
C	2-9							
D	2-9							
C7	4mmf				C10V4C			10TCC-V39
C8	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C9	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C10	300		1468-0003		5W5T27	CM-19B-301M	MC241	1FM-33
C11	8mmf		NPO-SI 8.2		C10V8C			10TCC-V82
C12	.002		1468-002		5W5D2	CM-19B-202M	MC457	1FM-22
C13	.002		BPD-002	DM-202	BYA10D2	CCD-202	B-220	5HK-D20
C14	.04							
C15	.04							
C16	6mmf				C10V6C			
C17A	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
B	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C18	4mmf				C10V4C			10TCC-V39

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C19A	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
B	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C20	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C21	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C22	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C23	.005		BPD-005	DM-502	H-05D5	CCD-502	TA-250	TG-D5
C24	.02		BPD-02	DD-203	H-05S2		TA-120	TG-S20
C25	.04							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HITACHI PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	½						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	39K				R14	56K			
R3	4700Ω				R15	22K			
R4	2200Ω				R16	2200Ω			
R5	2700Ω				R17	5600Ω			
R6	270K				R18	1000Ω			
R7	33K				R19	39K			
R8	4700Ω				R20	10K			
R9	330Ω				R21	1800Ω			
R10	820Ω				R22	6800Ω			
R11	150K				R23	18Ω			
R12	560Ω				R24	220Ω			
R13	820Ω								

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		HITACHI PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	BC Loopstick						
L2	SW Ant.						
L3	BC Osc.						
L4	SW Osc.						
L5	1st IF						
L6	2nd IF						
L7	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	HITACHI PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1,5	1	CT-70					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	HITACHI PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2000Ω CT	10-12Ω	OT-72-2					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HITACHI PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10-12Ω	SP-2302	22A06Z8	

BATTERIES

ITEM No.	VOLTAGE	HITACHI PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	006P		2U6		216		M-1604	

SIGNAL DIODES

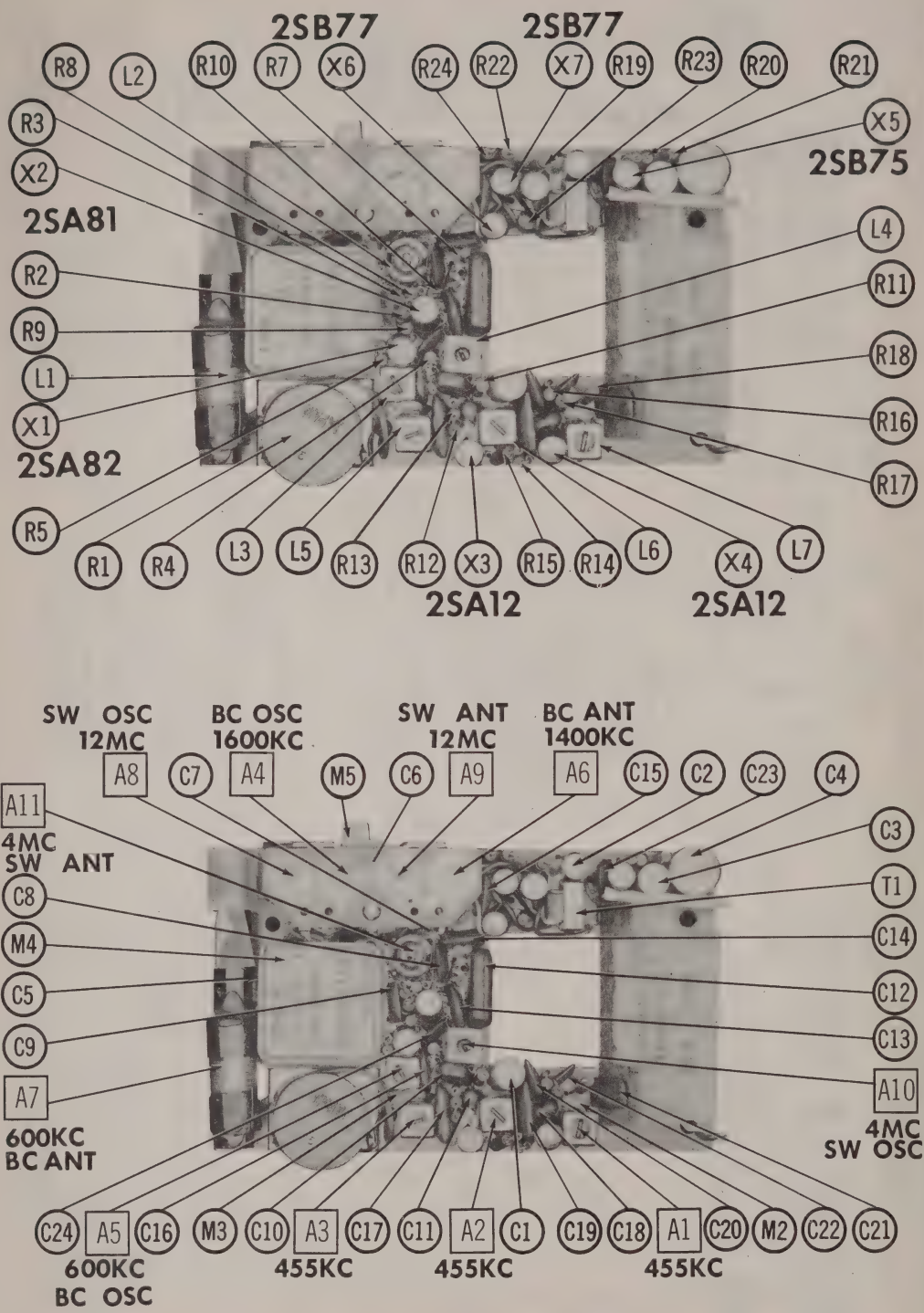
ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		HITACHI PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M2	1N34A			1N34A	Detector
M3	HV15				Bias Regulator
M4	1N34A			1N34A	AVC

MISCELLANEOUS

ITEM No.	PART NAME	HITACHI PART No.	NOTES
M5	Tuning Cap.		2 Gang
M6	Switch		Band Selector (Pushbutton Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



CHASSIS TOP VIEW

PHOTOFACT® Folder

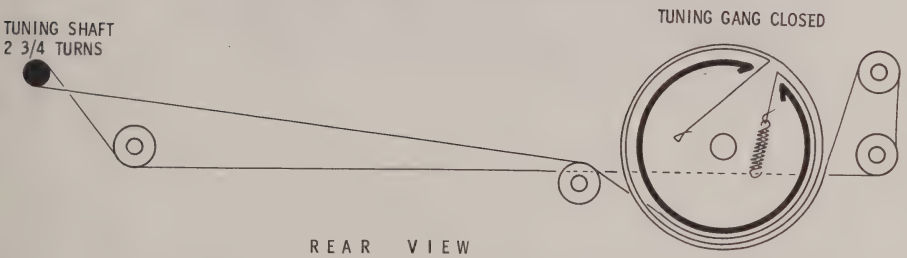
**KNIGHT MODEL
KN-150 (35DU779)**

KNIGHT MODEL
KN-150 (35DU779)

KNIGHT MODEL
KN-150 (35DU779)

TRADE NAME	Knight Model KN-150 (35DU779)
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois
TYPE SET	AC Operated 12 Tube FM Tuner
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles
TUNING RANGE – FREQ. MOD.	88 – 108MC RATING 52 Watts, .48 Amp. @ 117 Volts AC

DIAL CORD STRINGING



SET 561 FOLDER 12

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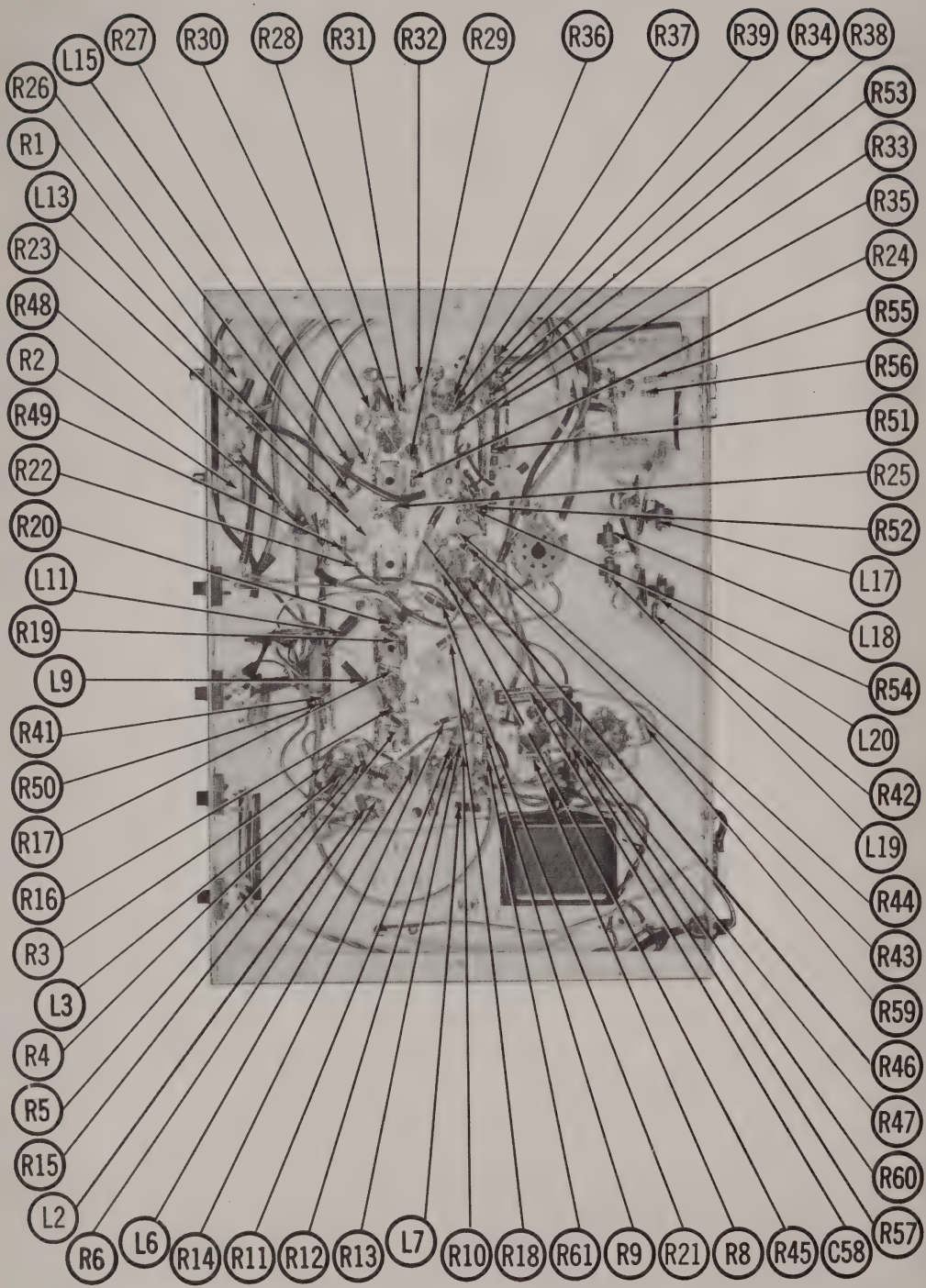
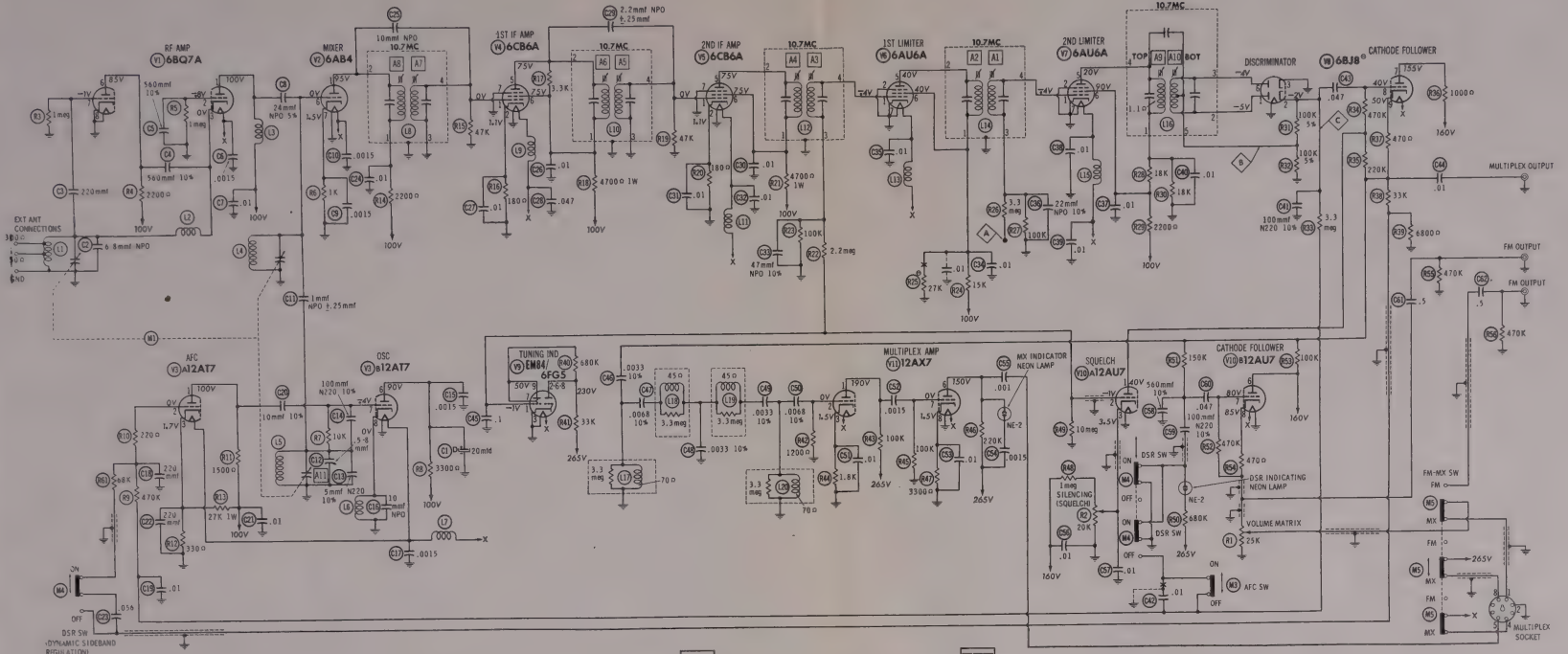


CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.



COLOR DOT

TERM VIEW L8, L10, L12 & L14

TERM VIEW L16

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	†3400Ω	1meg	.1Ω	FIL	FIL	†5600Ω	1meg	0Ω	0Ω
V2	6AB4	†5600Ω	0Ω	FIL	FIL	0Ω	.1Ω	1000Ω		
V3	12AT7	†4900Ω	470K ■4meg	330Ω	FIL	FIL	†6700Ω	10K	.1Ω	FIL
V4	6CB6A	.1Ω	180Ω	FIL	FIL	†8100Ω	†8100Ω	0Ω		
V5	6CB6A	.1Ω	180Ω	FIL	FIL	†8100Ω	†8100Ω	0Ω		
V6	6AU6A	100K	0Ω	FIL	FIL	†15K	†15K	0Ω		
V7	6AU6A	100K	0Ω	FIL	FIL	†23K	†5600Ω	0Ω		
V8	6BJ8	100K	200K	0Ω	FIL	FIL	100K	†3200Ω	700K	30K
V9	EM84 6FG5	2.2meg	NC	0Ω	FIL	FIL	†33K	†710K	NC	†710K
V10	12AU7	250K	2.2meg	18K	FIL	FIL	†2200Ω	495K	25K	FIL
V11	12AX7	†100K	1200Ω	1800Ω	FIL	FIL	†220K	100K	3300Ω	FIL
V12	EZ80 6V4	345Ω	TP	¶ 15K	FIL	FIL	TP	350Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS MADE WITH AFC & DSR OFF IN FM POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM PIN 3 OF V12. NC NO CONNECTION
■ MEASURED WITH AFC SWITCH ON. TP THE POINT

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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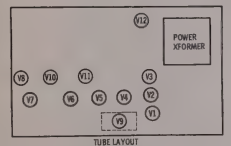
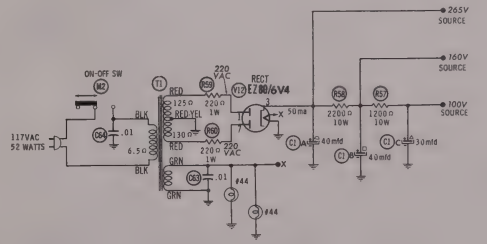
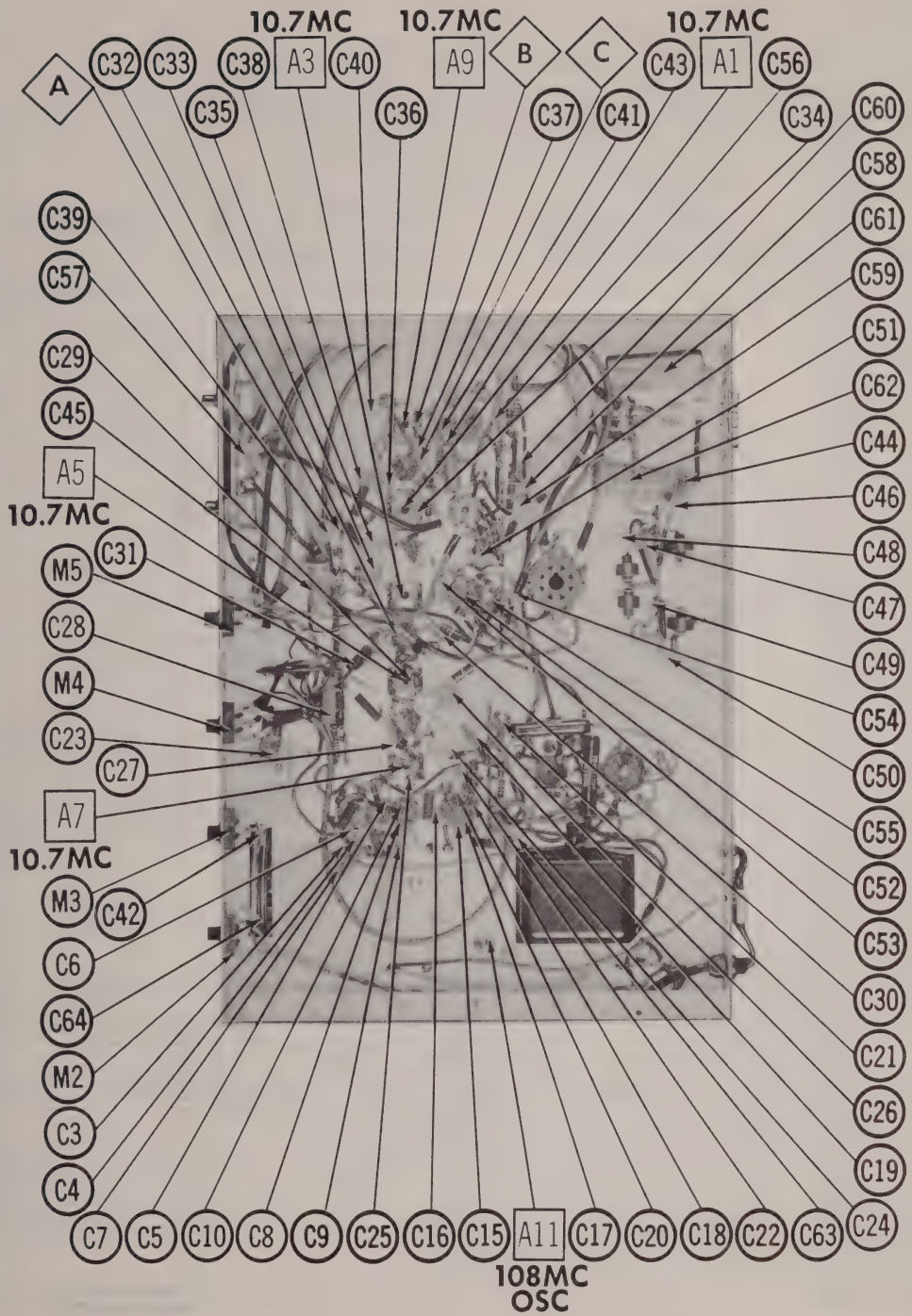




KNIGHT MODEL KN-150 (35DU779)



CHASSIS BOTTOM VIEW-ALIGN., CAPACITOR & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:
A1 thru A8... GENERAL CEMENT #5097, 8727
WALSCO #2515
A9, A10..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
All... ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

AFC Off

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .001mfd to pin 6 (grid) of Mixer. Low side to chassis.	10.7MC (Unmod.)	Point of non-interference.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6, A7, A8	Adjust for maximum deflection.
2.	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A9	"
3.	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

AFC Off
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to pin 6 (grid) of Mixer. Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference.	Vert. amp. to point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6, A7, A8	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
2.	"	"	"	Vert. amp. thru 1meg to point (B). Low side to chassis.	A9	"
3.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A10	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of cross-over lines.

RF ALIGNMENT

AFC Off.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side to 50Ω ant. terminal. Low side to chassis.	108MC (Unmod.)	108MC	DC probe to point (A). Common to chassis.	A11	Adjust for maximum deflection.
5.	"	88MC	88MC	"	L5	Adjust for maximum deflection by expanding or compressing coil turns.

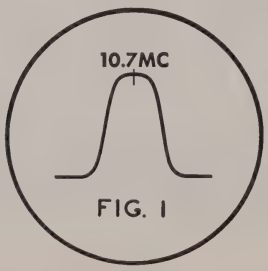


FIG. 1

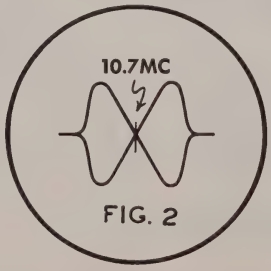


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC • USE	TYPE	RAYTHEON • ITEM No.	SYLVANIA • USE	TYPE
V1	R F Amplifier	6BQ7A	V7	2nd Limiter	6AU6A
V2	Mixer	6AB4	V8	Discriminator-Cath. Foll.	6BJ8 (6BN8) *
V3	Osc.-AFC	12AT7	V9	Thumb Indicator	EM84/6FG5
V4	1st I F Amplifier	6CB6A	V10	Squelch-Cath. Follower	12AU7
V5	2nd I F Amplifier	6CB6A	V11	Multiplex Amp.	12AX7
V6	1st Limiter	6AU6A	V12	Rectifier	EZ80/6V4

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	KNIGHT PART No.	AEROVOX PART No.	REPLACEMENT DATA CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	40	300		AFH4-02-10	D0022	XC4-55	FP430. 36	TMQ-4161	TVL-4580
B	40	300							
C	30	250							
D	20	200							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	6.8 NPO		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C3	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C4	560 10%		DI-560	DD-561	5R5T56	CCD-561	GP356	10TS-T56
C5	560 10%		DI-560	DD-561	5R5T56	CCD-561	GP356	10TS-T56
C6	.0015		BPD-0015	DD-152	BYA10S1	CCD-103	B-110	5HK-S10
C7	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	24 NPO 5%			TCZ-24	C10Q24C	CCTO-240	CNO-425	10TCC-Q25
C9	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C10	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C11	1 NPO ± .25mmf		NPO-DI 1.0	TCZ-1			CNO-510	10TCC-V10
C12	5-8					*		
C13	100 N220 10%					*		10TCR-V50
C14	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	10TCR-T10
C15	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	5HK-D15
C16	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	10TCC-Q10
C17	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C18	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10 10%		NPO-SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C21	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C23	.056 200V		P684CM-057		DPM56S6	6DP-3-563	GEM-6156	6PS-S56
C24	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C26	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C29	2.2 NPO ± .25mmf		NPO-DI 2.2	DTZ-2R2	C1V22C	CCTO-2R2	CNO-522	10TCC-V22
C30	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C32	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C33	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C34	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C37	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C38	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C40	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	100 N220 10%					*		10TCR-T10
C42	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C44	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-2P1	2TM-P10
C46	.0033 10%		DI-3300		PM6D33	CCD-332	TL-233	10TS-D33

CHASSIS—TOP VIEW

KNIGHT MODEL KN-150 (35DU770)

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C47	.0068 10%		DI-6800		PM6D68	CCD-682	GEM-6268	10TS-D68
C48	.0033 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C49	.0033 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C50	.0068 10%		DI-6800		PM6D68	CCD-682	GEM-6268	10TS-D68
C51	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C53	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C54	.0015		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C55	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C56	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C57	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	560 10%		DI-560	DD-561	5R5T56	CCD-561	GP 356	10TS-T56
C59	100 N220 10%				*	*		10TCR-T10
C60	.047 200V		P288N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	2TM-S47
C61	.5 200V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P50
C62	.5 200V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P50
C63	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C64	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	25K	½	RP-253C	B-25	A47-25K-W	Q13-120	U28A	Volume Matrix
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	20K	½	RP-203D	B-22	A47-20K-S	Q11-119	U26	Silencing (Squelch)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	1meg				R33	3.3meg			
R4	2200Ω				R34	470K			
R5	1meg				R35	220K			
R6	1000Ω				R36	1000Ω			
R7	10K				R37	470Ω			
R8	3300Ω				R38	33K			
R9	470K				R39	6800Ω			
R10	220Ω				R40	680K			
R11	1500Ω				R41	33K			
R12	330Ω				R42	1200Ω			
R13	27K 1W				R43	100K			
R14	2200Ω				R44	1800Ω			
R15	47K				R45	100K			
R16	180Ω				R46	220K			
R17	3300Ω				R47	3300Ω			
R18	4700Ω 1W				R48	1meg			
R19	47K				R49	10meg			
R20	180Ω				R50	680K			
R21	4700Ω 1W				R51	150K			
R22	2.2meg				R52	470K			
R23	100K				R53	100K			
R24	15K				R54	470Ω			
R25	27K			Note 1	R55	470K			
R26	3.3meg				R56	470K			
R27	100K				R57	1200Ω 10W	PW10-1200	10W-SQ-1200	
R28	18K				R58	2200Ω 10W	PW10-2200	10W-SQ-2200	
R29	2200Ω				R59	220Ω 1W			
R30	18K				R60	220Ω 1W			
R31	100K 5%				R61	68K			
R32	100K 5%								

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		KNIGHT PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant.						① Wound on 3.3meg
L2	RF Choke(.68uh)		BC-560	4590	RTC-8514	T803	
L3	RF Choke(3.3uh)		BC-564	4608	RTC-8518	T816	
L4	RF						
L5	Osc.						
L6	RF Choke(.68uh)		BC-560	4590	RTC-8514	T803	
L7	Fil. Choke(.68uh)		BC-560	4590	RTC-8514	T803	
L8	1st IF		FM-254	1463	RTC-8599	T633	
L9	Fil. Choke(.68uh)		BC-560	4590	RTC-8514	T803	
L10	2nd IF		FM-254	1463	RTC-8599	T633	
L11	Fil. Choke(.68uh)		BC-560	4590	RTC-8514	T803	
L12	3rd IF		FM-254	1463	RTC-8599	T633	
L13	Fil. Choke(.68uh)		BC-560	4590	RTC-8514	T803	
L14	4th IF		FM-254	1463	RTC-8599	T633	
L15	Fil. Choke(.68uh)		BC-560	4590	RTC-8514	T803	
L16	Discriminator		FM-253	1464	RTC-8665	T634	
L17	RF Choke(5MH)	①	BC-552	4538	RTC-9167	T844	
L18	RF Choke(2.5MH)	①	BC-549	4537	RTC-9166	T843	
L19	RF Choke(2.5MH)	①	BC-549	4537	RTC-9166	T843	
L20	RF Choke (5MH)	①	BC-552	4538	RTC-9167	T844	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	KNIGHT PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	
T1	117V ⓖ .48A	480VCT ⓖ .050A DC	6.3V ⓖ 4.6A	LP-0297					

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Tuning Cap.		2 Gang.
M2	Switch		Off-On (Slide Type - SPDT)
M3	Switch		AFC (Slide Type - SPDT)
M4	Switch		DSR (Slide Type - SPDT)
M5	Switch		Selector (Slide Type - 3PDT)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

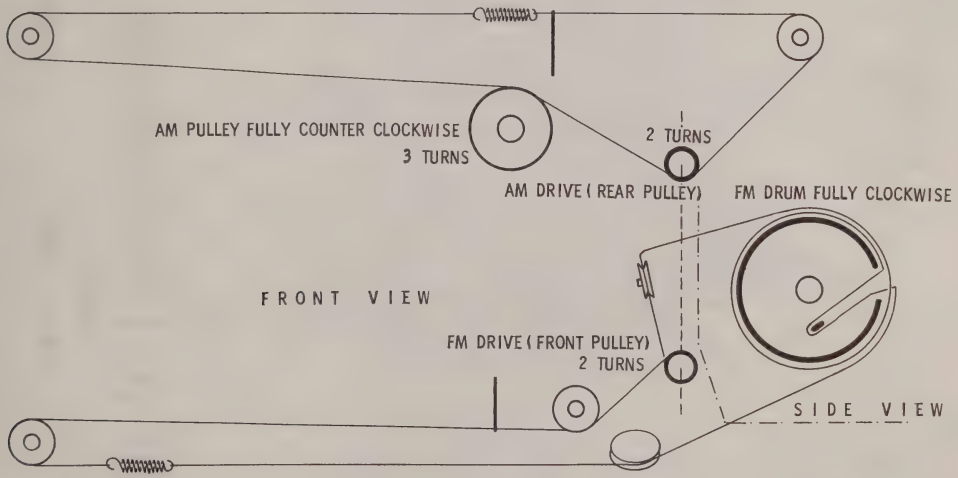
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

KORTING MODEL 1045

TRADE NAME	Korting Model 1045		
IMPORTER	Delmonico International, Div. of Thompson-Starrett Co., Inc., 120-20 Roosevelt Ave., Corona 68, N. Y.		
TYPE SET	AC Operated 7 Tube FM-BC-SW-LW Receiver		
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles	RATING	54 Watts, .5 Amp. @ 117 Volts AC
TUNING RANGE— BROADCAST	540 — 1600KC	LONG WAVE	150 — 360KC
FREQ. MOD.	88 — 108MC	SHORT WAVE	5.85 — 19MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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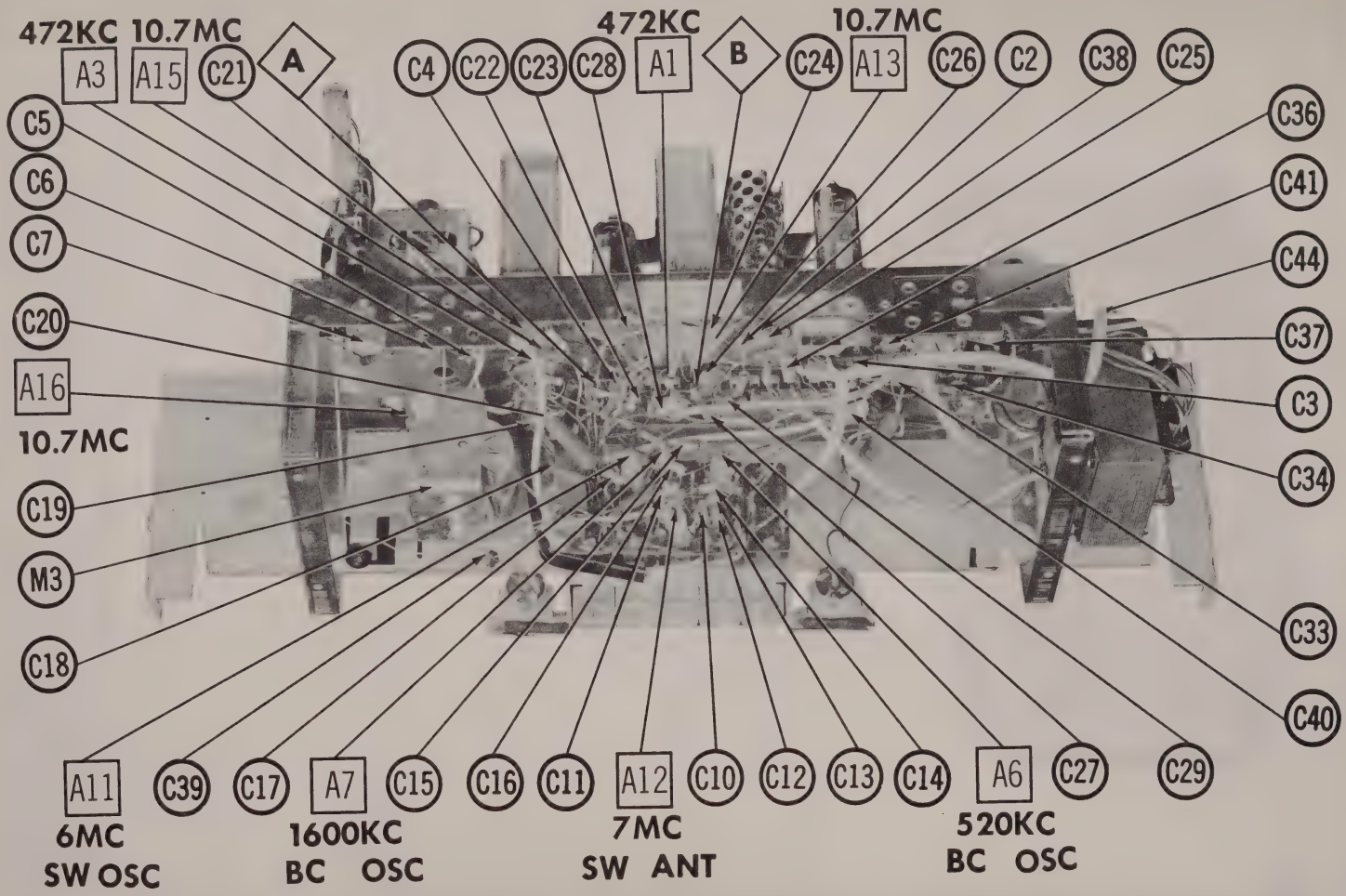
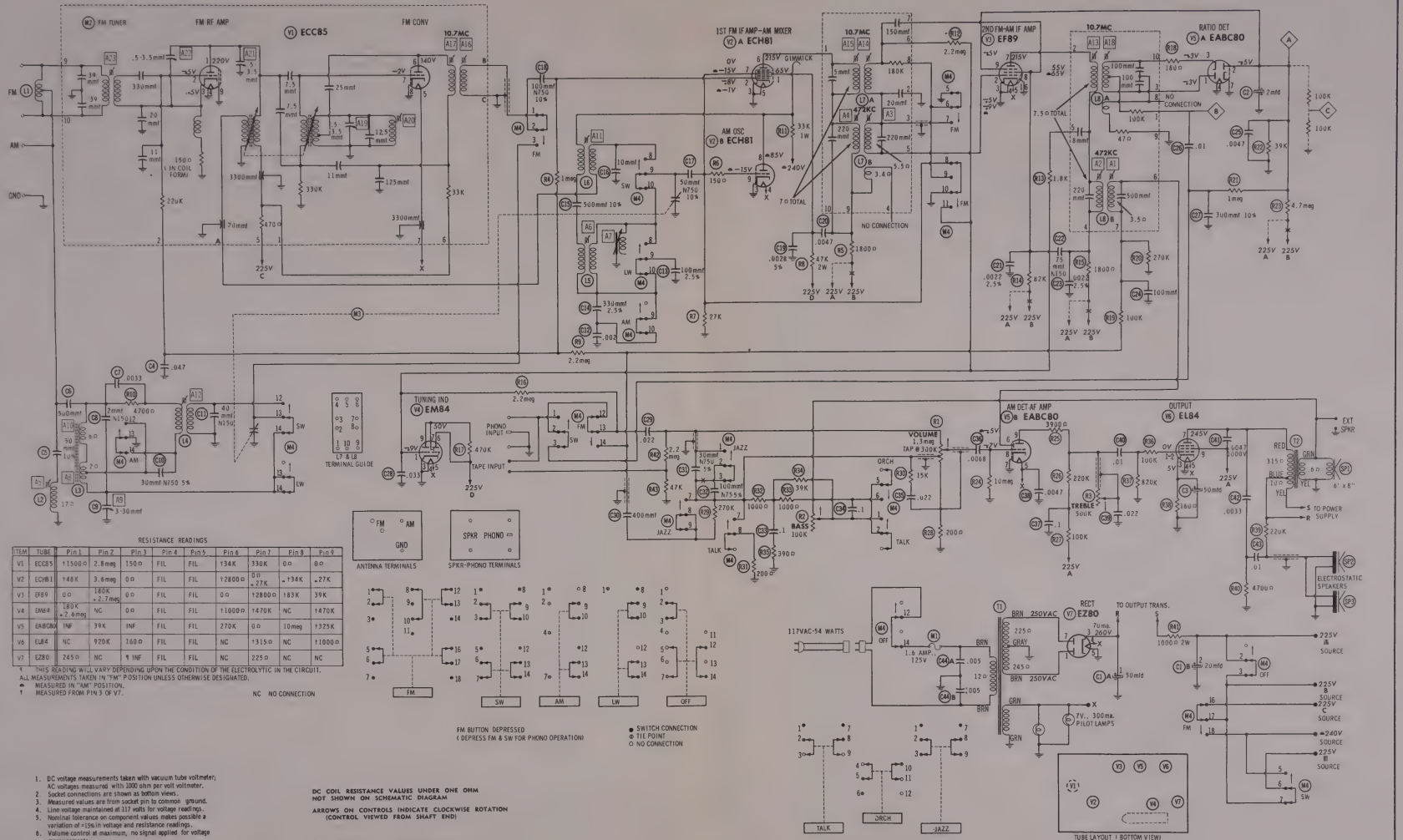
KK842

DATE 1—62 SET 561 FOLDER 13

KORTING MODEL 1045
KORTING MODEL 1045
SET 561 FOLDER 13



CHASSIS BOTTOM VIEW-ALIGN., CAPACITOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	↑1500Ω	2.8meg	150Ω	FIL	FIL	↑34K	330K	0Ω	0Ω
V2	ECH81	↑48K	3.6meg	0Ω	FIL	FIL	↑2800Ω	0Ω ←27K	←34K	←27K
V3	EF89	0Ω	180K ←2.7meg	0Ω	FIL	FIL	0Ω	↑2800Ω	↑83K	39K
V4	EM84	180K ←2.4meg	NC	0Ω	FIL	FIL	FIL	↑1000Ω	↑470K	NC	↑470K
V5	EABC80	INF	39K	INF	FIL	FIL	270K	0Ω	10meg	↑325K
V6	EL84	NC	920K	160Ω	FIL	FIL	NC	↑315Ω	NC	↑1000Ω
V7	EZ80	245Ω	NC	¶ INF	FIL	FIL	NC	225Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
← MEASURED IN "AM" POSITION.
↑ MEASURED FROM PIN 3 OF V7.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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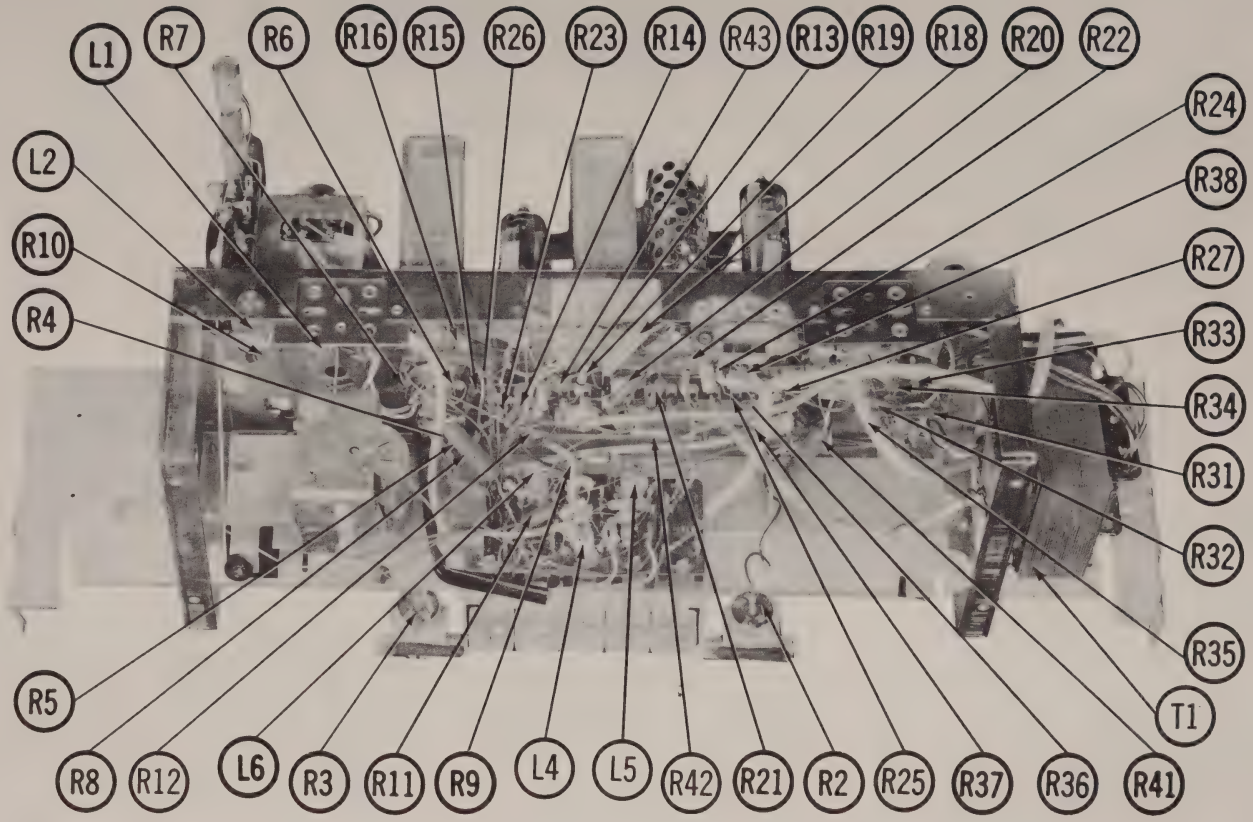
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SWITCH CONNECTION
⊕ TIE POINT
○ NO CONNECTION

KORTING MODEL 1045



CHASSIS BOTTOM VIEW-RESISTOR & INDUCTOR IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested Alignment Tools:
A19, A21, A22..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to AM antenna terminal. Low Low side to chassis.	472KC (400~ 30% AM)	(BC) 1000KC	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	"	"	A5	Adjust for MINIMUM output.
3.	"	520KC	520KC	"	A6	Adjust for maximum output.
4.	"	1600KC	1600KC	"	A7	"
5.	"	560KC	560KC	"	A8	Adjust by moving coil turns along ferrite loopstick core. Cement coil to core.
6.	"	1600KC	1600KC	"	A9	Adjust for maximum output.
7.	"	200KC	(LW) 200KC	"	A10	"
8.	"	6MC	(SW) 6MC	"	A11	"
9.	"	7MC	7MC	"	A12	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	High side to ungrounded tube shield over FM Converter. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point (A). Common to chassis.	A13, A14, A15, A16, A17	Adjust for maximum deflection.
11.	"	"	"	DC probe to point (B). Common to point (C).	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
10.	High side to ungrounded tube shield over FM Converter. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (A). Low side to chassis.	A13, A14, A15, A16, A17	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
11.	"	"	"	Vert. amp. to point (B). Low side to chassis.	A18	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	Across FM antenna terminals.	105MC (Unmod.)	(FM) 105MC	DC probe to point (A). Common to chassis.	A19	Adjust for maximum deflection.
13.	"	89MC	89MC	"	A20	"
14.	"	100MC	100MC	"	A21	"
15.	"	"	"	"	A22	Adjust for MINIMUM deflection.
16.	"	"	"	"	A23	Adjust for maximum deflection. Repeat Steps 12 thru 16.

FIG. 1

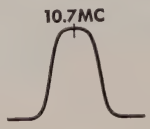


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	• GENERAL ELECTRIC • USE	TYPE	ITEM No.	• RAYTHEON • USE	• SYLVANIA • TYPE
V1	FM RF Amp. -FM Conv.	ECC85	V4	Tuning Indicator	EM84
V2	1st FM IF Amp. -AM Mixer-AM Osc.	ECH81	V5	Ratio Det. -AM Det. - AF Amp.	EABC80
V3	2nd FM IF Amp. - AM IF Amp.	EF89	V6	Output	EL84
			V7	Rectifier	EZ80

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	KORTING PART No.	AEROVOX PART No.	REPLACEMENT DATA CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	①50	350		PRS2420					
B	②50	350							
C2	2	10		PRS1705	NLW2-100	MT1-2	TT150X2	MLV2-100	TE-1401
C3	50	30		PTT98	NLW50-50	MT1-17	TC39	MLV50-50	TE-1307

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	50 10%		NPO-SI 50	D6-500	L10Q5	CCD-500	GP450	10TS-Q50
C6	.0033 500V		SI 500	D6-501	BYA10T5	CCD-501	B-350	10TS-T50
C7	2 N150		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C8	3-30					*		
C9	30 N750 5%			TCN-30	C10Q3C	*		
C10	40 N150							
C11	.002		SI 2000	D6-202	BYA10D2	CCD-202	B-210	5HK-D20
C12	100 2.5%			TCZ-100		CM-15E-101G	MCE235	
C13	330 2.5%			TCZ-330		CM-15E-331G		
C14	500 10%			D6-501	5R5T5	CCD-501	GP350	10TS-T50
C15	10		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C16	50 N750 10%		N750-SI 50	TCN-50	C10Q5U	CCTN-470	CN7-447	10TCU-Q47
C17	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C18	.0028 5%				IR5D27	CM-20B-272J	MCJ460.5	MS-227
C19	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C20	.0022 2.5%					CM-20E-222G	MCE459	
C21	75 N150					*		
C22	.0022 2.5%					CM-20E-222G	MCE459	10TCR-Q75
C23	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C24	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C25	.01 250V		P488N-01	D6-103	CUB6S1	CCD-103	GEM-411	4TM-S10
C26	300 10%			D6-301	L10T3	CCD-301	GP334	10TS-T30
C27	.033 250V		P488N-033	DD-303	CUB6S33	4DP-3-333	GEM-4133	4TM-S33
C28	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C29	400			D6-401	L10T4	CCD-401	GP340	10TS-T40
C30	30 N750 5%			TCN-30	C10Q3U	*		
C31	100 N75 5%							
C32	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C33	.1 250V		P488N-1	DF-104	CUB4P1	4DP-1-104	GEM-401	4TM-P10
C34	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C35	.0068 500V		P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C36	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C37	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C38	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C39	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C40	.0047 1000V		P1068N-0047	DD-472	CUB10D47	16DP-2-472	GEM-10247	10TM-D47
C41	.0033 500V		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C42	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C43	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
C44 A	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50
B	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D50

CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KORTING PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1.3meg			ABT-73				Volume
B	Shaft			AK-29				
R2	100K							Bass
R3A	500K			AB-60				Treble
B	Shaft			AK-29				

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	1meg				R24	10meg			
R5	1800Ω				R25	3900Ω			
R6	150Ω				R26	220K			
R7	27K				R27	100K			
R8	47K 2W				R28	200Ω			
R9	2.2meg				R29	270K			
R10	4700Ω				R30	15K			
R11	33K 1W				R31	200Ω			
R12	2.2meg				R32	1000Ω			
R13	1800Ω				R33	1000Ω			
R14	82K				R34	39K			
R15	1800Ω				R35	390Ω			
R16	2.2meg				R36	100K			
R17	470K				R37	820K			
R18	180Ω				R38	160Ω			
R19	100K				R39	220K			
R20	270K				R40	4700Ω			
R21	1meg				R41	1000Ω 2W			
R22	39K				R42	2.2meg			
R23	4.7meg				R43	47K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		KORTING PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant. Matching	BV652					
L2	472KC IF Trap	BV701					
L3A	LW Loopstick	BV746					
B	BC Loopstick						
L4	SW Ant.	BV725					
L5	LW & BC Osc.	BV657					
L6	SW Osc.	BV702					
L7A	2nd FM IF	BV787					
B	1st AM IF						
L8A	Ratio Detector	BV788					
B	2nd AM IF						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	KORTING PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V② .5A	500VCT ②.070A	6.3V② 3.2A	BV1063	P-3051①	PM-8403①	24R09①	R-108-B ①	① Tape 5V & CT on 6.3V Winding

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	KORTING PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω Tap②3%	3-4Ω	BV1046	A-3032①		24S51A①		① Drill New Mounting Hole(s).

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	KORTING PART No.	QUAM PART No.	
SP1	6"x 8"	PM	3-4Ω			
SP2	Electrostatic					
SP3	Electrostatic					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			KORTING PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1 6/10 125V S/B			31301.6 (3AG 1 6/10A 125V S/B)		MDX 1 6/10	

MISCELLANEOUS

ITEM No.	PART NAME	KORTING PART No.	NOTES
M2	FM Tuner		Complete
M3	Tuning Cap.		AM, 2 Gang
M4	Switch		Function Selector (Pushbutton Type, Complete)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

LAFAYETTE MODELS HE-20AWX (Series 3, 4, 5), HE-20WX (Series 3)

LAFAYETTE MODELS HE-20AWX
(Series 3, 4, 5), HE-20WX (Series 3)

LAFAYETTE MODELS HE-20AWX
(Series 3, 4, 5), HE-20WX (Series 3)

TRADE NAME	Lafayette Models HE-20AWX Series 3, 4, 5; HE-20WX Series 3
SUPPLIER	Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.
TYPE SET	AC-Battery Operated 7 Tube Citizens Band Transmitter-Receiver
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles (or) 12 Volt Storage Battery
RATING	51 Watts, .5 Amp. @117 Volts AC (or) 4.3 Amp. @12.6 Volts DC
TUNING RANGE	Any 4 of Citizens Band Channels 1 thru 23 (Receiver may be crystal controlled or manually tuned)

NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES & REGULATIONS PART 19, SUBPART D, SECTION 19.71).

SET 561 FOLDER 14

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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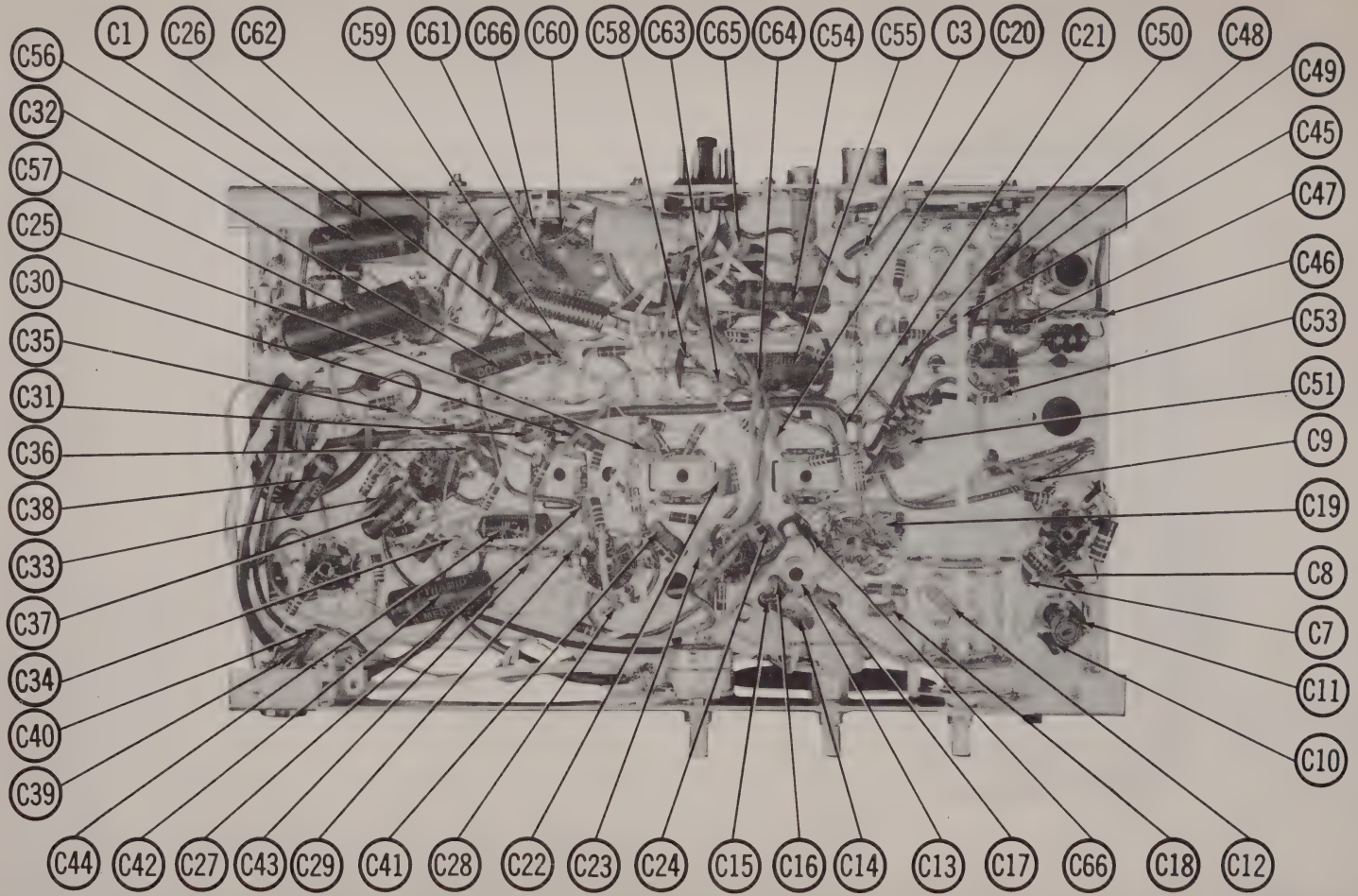
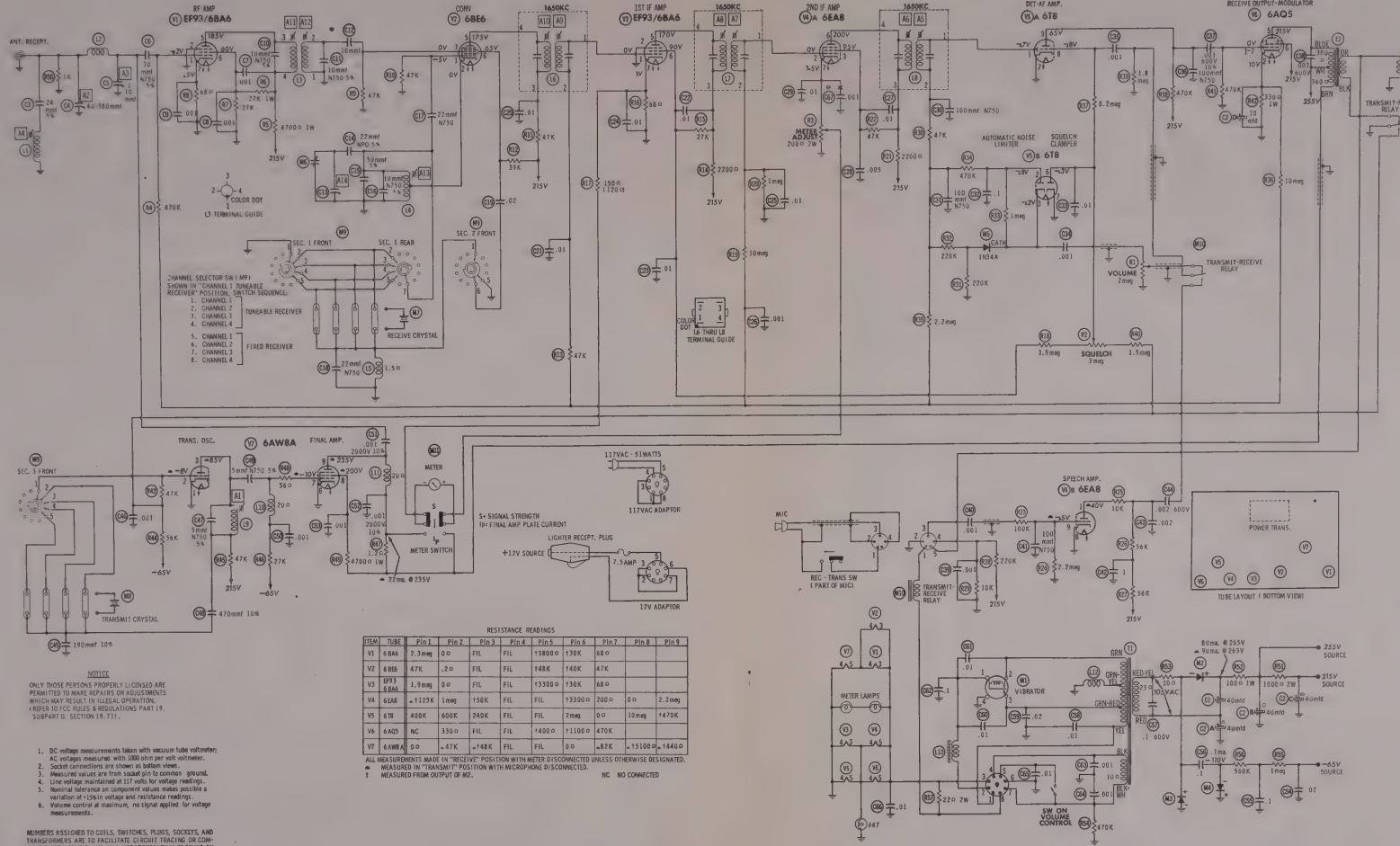


CHASSIS BOTTOM VIEW-CAPACITOR IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	2.3meg	0Ω	FIL	FIL	†5800Ω	†30K	68Ω		
V2	6BE6	47K	.2Ω	FIL	FIL	†48K	†40K	47K		
V3	EF93 6BA6	1.9meg	0Ω	FIL	FIL	†3300Ω	†30K	68Ω		
V4	6EA8	▲1123K	1meg	†50K	FIL	FIL	†3300Ω	200Ω	0Ω	2.2meg
V5	6T8	400K	600K	240K	FIL	FIL	2meg	0Ω	10meg	†470K
V6	6AQ5	NC	330Ω	FIL	FIL	†400Ω	†1100Ω	470K		
V7	6AW8A	0Ω	▲47K	▲48K	FIL	FIL	0Ω	▲82K	▲15100Ω	▲1440Ω

ALL MEASUREMENTS MADE IN "RECEIVE" POSITION WITH METER DISCONNECTED UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "TRANSMIT" POSITION WITH MICROPHONE DISCONNECTED.
† MEASURED FROM OUTPUT OF M2.
NC NO CONNECTED

NOTICE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES & REGULATIONS PART 19, SUBPART D, SECTION 19.731.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MEMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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LAFAYETTE MODELS HE-20AWX (Series 3, 4, 5), HE-20WX (Series 3)

CHASSIS BOTTOM VIEW-RESISTOR IDENT.

ALIGNMENT INSTRUCTIONS

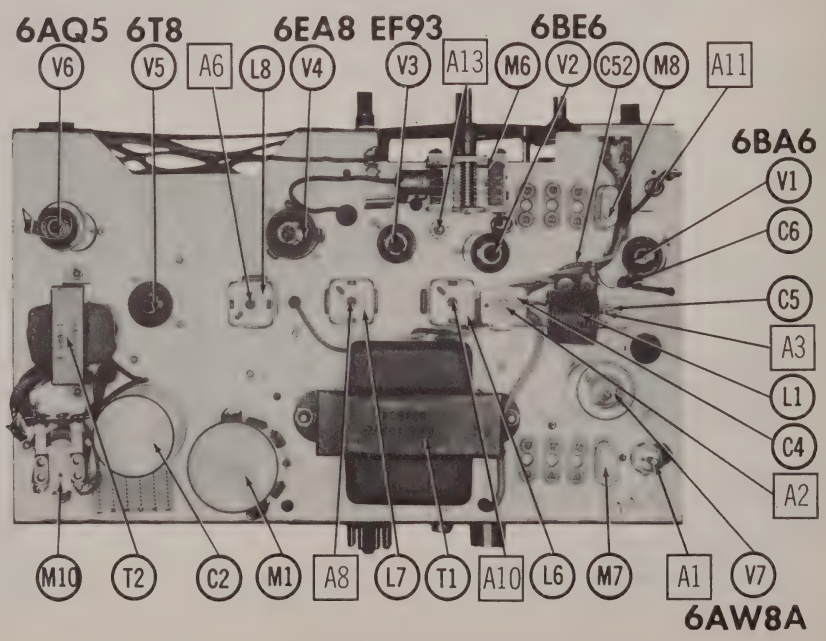
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

RECEIVER ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	1650KC (400~ 30% AM)	9 (Fixed)	Across voice coil.	A5, A6, A7, A8, A9, A10	Turn Volume and Squelch controls fully clockwise. Adjust for maximum output.
2.	Across antenna receptacle.	27.065MC	"	"	A11	Connect a 100Ω resistor in series with a .005mfd capacitor across the secondary of L3. Adjust A11 for maximum output.
3.	"	27.065MC	9	"	A12	Move the capacitor and resistor to the primary and adjust A12 for maximum output.
4.	"	26.965MC	1 (Tuneable)	"	A13	With Volume and Squelch controls fully clockwise, adjust A13 for maximum output. Two peaks will be found. Use the higher of the two.
5.	"	27.255MC	23 (Tuneable)	"	A14	Adjust for maximum output. Repeat Steps 4 and 5 until proper calibration is obtained.

TRANSMITTER ALIGNMENT

1. Insert a dummy antenna (47 lamp or 52Ω 5W non-inductive load) into antenna receptacle. If load is used, parallel with RF voltmeter.
2. Set selector to the Fixed Channel position having Channel 9 crystal.
3. Hold transmit button and make the following adjustments:
   a. A1 for maximum lamp brilliance or maximum voltage.
   b. Turn A2 fully tight, then back off 1/2 turn.
   c. A3 for maximum lamp brilliance, maximum voltage, or minimum dip on front panel Ip meter.
   d. A2 for maximum lamp brilliance, maximum voltage, or minimum dip on front panel Ip meter.
4. Press and release transmit button several times. The output indicator should show that the transmitter is operating each time. If not, back out A1 1/4 turn at a time until transmitter operates each time the button is pressed.
5. A4 is adjusted for minimum interference to TV receivers on the 3 lower TV channels of the area.



CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	RF Amplifier	EF93/6BA6
V2	Converter	6BE6
V3	1st IF Amplifier	EF93/6BA6
V4	2nd IF Amp. -Speech Amp.	6EA8 (6U8A)*
V5	Det. -ANL-Squelch Clamper-AF Amplifier	6T8
V6	Rec. Output-Modulator	6AQ5
V7	Trans. Osc. -Final Amp.	6AW8A

* Alternate

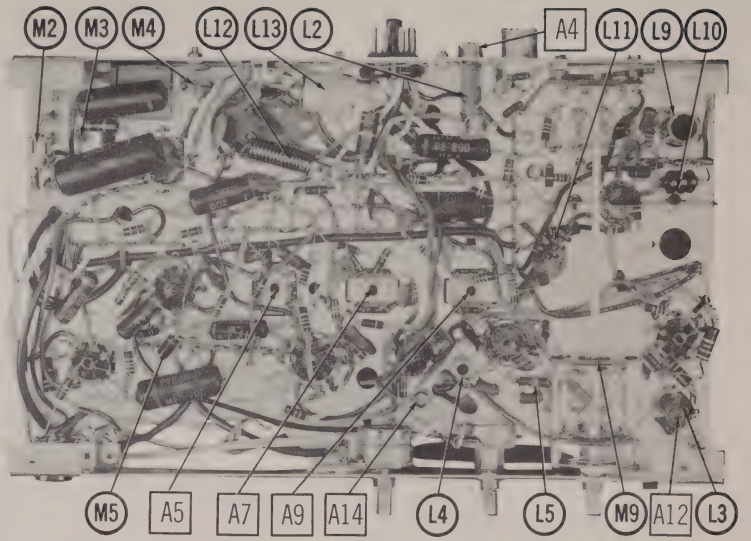
ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA LAFAYETTE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	40	200		PRS1580	BR4025	QT1-14	TC58	TD-40-250	TVA-1511
C2A	▲40	200		AFH3-43	C0340	XC4-22	FP420, 36	TMT-3700	TVL-3785
B	■40	350		PRS1580	BR4035			TD-40-350	TVA-1611
C	▲40	350							
D	10	50							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	24 5%		1469-000024	TCZ-24	22R5Q24	CM-19B-240J	CNO-425	MS-424
C4	40-380							
C5	1-10			829-10				
C6	10 N750 5%		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C7	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	10 N750 5%		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C11	10 N750 5%		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C12	10		1469-00001	TCZ-10	22R5Q1	CM-19B-100M	MCB215	MS-41
C13								
C14	22 NPO 5%			DTZ-22	C10Q22C		CNO-422	10TCC-Q22
C15	50 5%		1469-00005	TCZ-50	22R5Q5	CM-19B-500J	MCE225	MS-45
C16	10 N750 5%		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C17	22 N750		N750-SI 22	TCN-22	C10Q22U	CCTN-22	CN7-422	10TCU-Q22
C18	22 N750		N750-SI 22	TCN-22	C10Q22U	CCTN-22	CN7-422	10TCU-Q22
C19	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C20	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C24	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C27	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C29	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C31	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C32	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C33	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C35	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C36	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C37	.001 600V 10%		V84C6D1-10%		PM6D1	6DP-1-102	GEM-1621	6TM-D10
C38	.003 600V		P688N-003	D6-302	CUB6D3	6DP-1-302	GEM-623	6TM-D30
C39	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C40	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C41	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C42	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C43	.002		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C44	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D20
C45	190 10%		1469-0002	TCZ-200	22R5T2	CM-19B-201K	MCB237	MS-32
C46	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C47	5 N750 5%		N750-SI 5	TCN-5	C10V5U	CCTN-050	CN7-550	10TCU-V50
C48	470 10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C49	5 N750 5%		N750-SI 5	TCN-5	C10V5U	CCTN-050	CN7-550	10TCU-V50
C50	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C51	.001 2000V 10%							

CHASSIS—BOTTOM VIEW



FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C52	.001 2000V 10%							
C53	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C54	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S20
C55	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C56	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C57	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C58	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C59	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C60	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C61	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C62	.1 50V			DDA-104	H-05P1	1DP-2-104	TA-010	TG-P10
C63	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C64	.001		BPD-001	DD-102	BPA10D1	CCD-102	B-210	5HK-D10
C65	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C66	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C67	.001	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA LAFAYETTE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	V-332A-2	B-76	A47-1meg-Z	Q13-139	U55	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	LAFAYETTE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R2A	3meg	½	V-331A-2	B-84			U57	Squelch
B	Bushing			AK-31			EB247	
R3A	200Ω	2(WW)		WN-101	A43-200	W11-100		Meter Adjust
B	Shaft			Not Req.	FKS-1/4	SK5		

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	470K				R31	220K			
R5	4700Ω 1W				R32	220K			
R6	27K 1W				R33	1meg			
R7	27K				R34	470K			
R8	68Ω				R35	2.2meg			
R9	47K				R36	10meg			
R10	47K				R37	8.2meg			
R11	47K				R38	470K			
R12	39K				R39	1.8meg			
R13	47K				R40	1.5meg			
R14	2200Ω				R41	470K			
R15	27K				R42	330Ω 1W			
R16	68Ω				R43	47K			
R17	150Ω			(120Ω) *	R44	56K			
R18	1.5meg				R45	47K			
R19	10meg				R46	27K			
R20	1meg				R47	1.2Ω			
R21	2200Ω				R48	56Ω			
R22	47K				R49	4700Ω 1W			
R23	100K				R50	1000Ω			
R24	2.2meg				R51	1000Ω 2W			
R25	10K				R52	100Ω 1W			
R26	56K				R53	10Ω			
R27	56K				R54	470K			
R28	220K				R55	1meg			
R29	10K				R56	560K			
R30	47K				R57	22Ω 2W			

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		LAFAYETTE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant.						
L2	TV Trap						
L3	RF						
L4	Osc.						
L5	RF Choke (7.2uh)		BC-565	4611	RTC-8521	T821	
L6	1st IF						
L7	2nd IF						
L8	3rd IF						
L9	Osc. Plate						
L10	RF Choke(500uh)		TV-188	6174	RTC-8592	T324	
L11	RF Choke(500uh)		TV-188	6174	RTC-8592	T324	
L12	RF Choke(.56uh)						
L13	Hash Choke (30uh)						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	LAFAYETTE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .5A or 12.6VCT @ 2.5A	105V @ .3A AC	12.6V @ 1.8A (AC Only)	PTV-183-2					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	LAFAYETTE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	10.7K Tap @ 4600Ω	3-4Ω	T-184-1					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	LAFAYETTE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	ST17-1	4A07	

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				LAFAYETTE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.3V	115~		6301	G-1601	6301	

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	LAFAYETTE PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M2	.080A		1N1763	40H	
M3	.080A		1N1763	40H	
M4	.0001			Model 12	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		LAFAYETTE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
M5	1N34A			1N34A	Noise Limiter

MISCELLANEOUS

ITEM No.	PART NAME	LAFAYETTE PART No.	NOTES
M6	Variable Cap.		1 Gang, Receiver Tuning
M7	Crystal		Receive (Order Channel Desired)
M8	Crystal		Transmit (Order Channel Desired)
M9	Switch		Channel Selector (Rotary Wafer Type)
M10	Relay		
M11	Meter		

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Shielded Hook-up Wire ..... Use BELDEN No. 8885

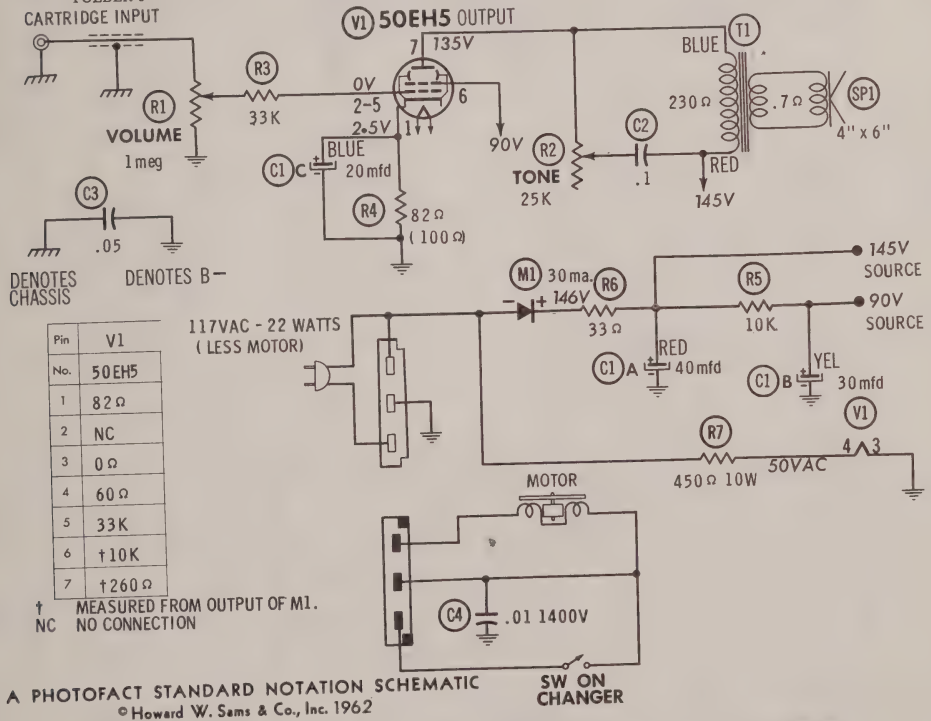
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT® Folder

MAGNAVOX CHASSIS 90-01

TRADE NAME	Magnavox Chassis 90-01
MANUFACTURER	The Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	AC Operated One Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 22 Watts, .21 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER – SEE SIMILAR COLLARO TC-99 – PHOTOFACT SET 464 FOLDER 6



Pin No.	V1
1	82Ω
2	NC
3	0Ω
4	60Ω
5	33K
6	†10K
7	†260Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MAGNAVOX CHASSIS 90-01
MAGNAVOX CHASSIS 90-01
SET 561 FOLDER 15

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆			RAYTHEON ◆		SYLVANIA ◆	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Output	50EH5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	40	150	270057-1	PRS3625	BBRT43215	QT3-5	TCT3105	TDLT-3	TVA-3448
B	30	150							
C	20	150							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C3	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C4	.01 1400V		DAC-27	DD16-103	HVE16S1	16DP-2-103	UAC-110	BL-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	220169-1	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	25K	½	220170-1	B-26	A4◆-25K-S	Q11-120	U29	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	33K			(1000Ω) *	R6	33Ω			
R4	82Ω				R7	450Ω 10W			
R5	10K								

* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	320093-1	A-3025	A-3332	24S53	S-12X	

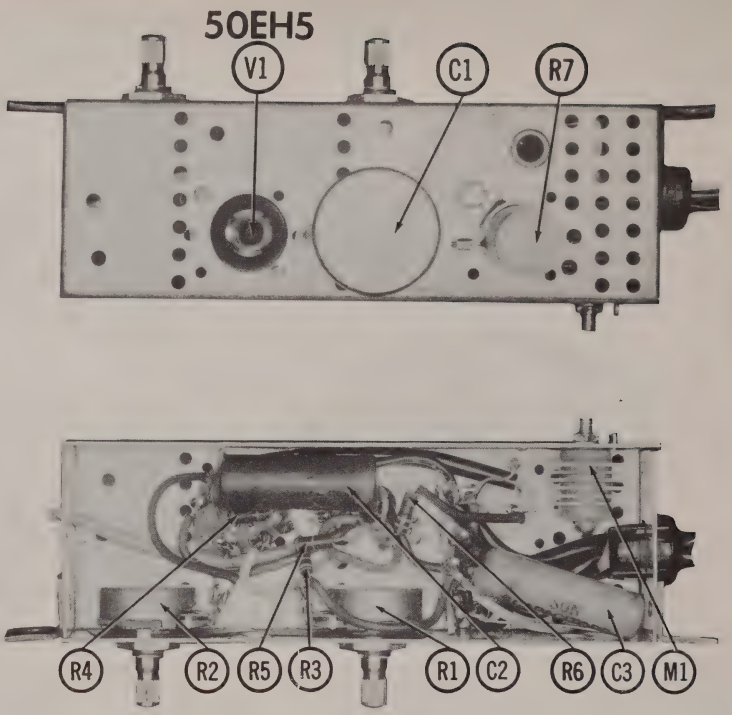
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No.	QUAM PART No.	
SP1	4"x 6"	PM	3-4Ω	580072-1 *	46A07	* Includes T1

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT (Measured)	MAGNAVOX PART No.	RCA PART No.	SARKES TARZIAN PART No.	
M1	.030A	530068-1 *	1N1763 ‡	65 *	* Selenium ‡ Silicon

CHASSIS VIEW



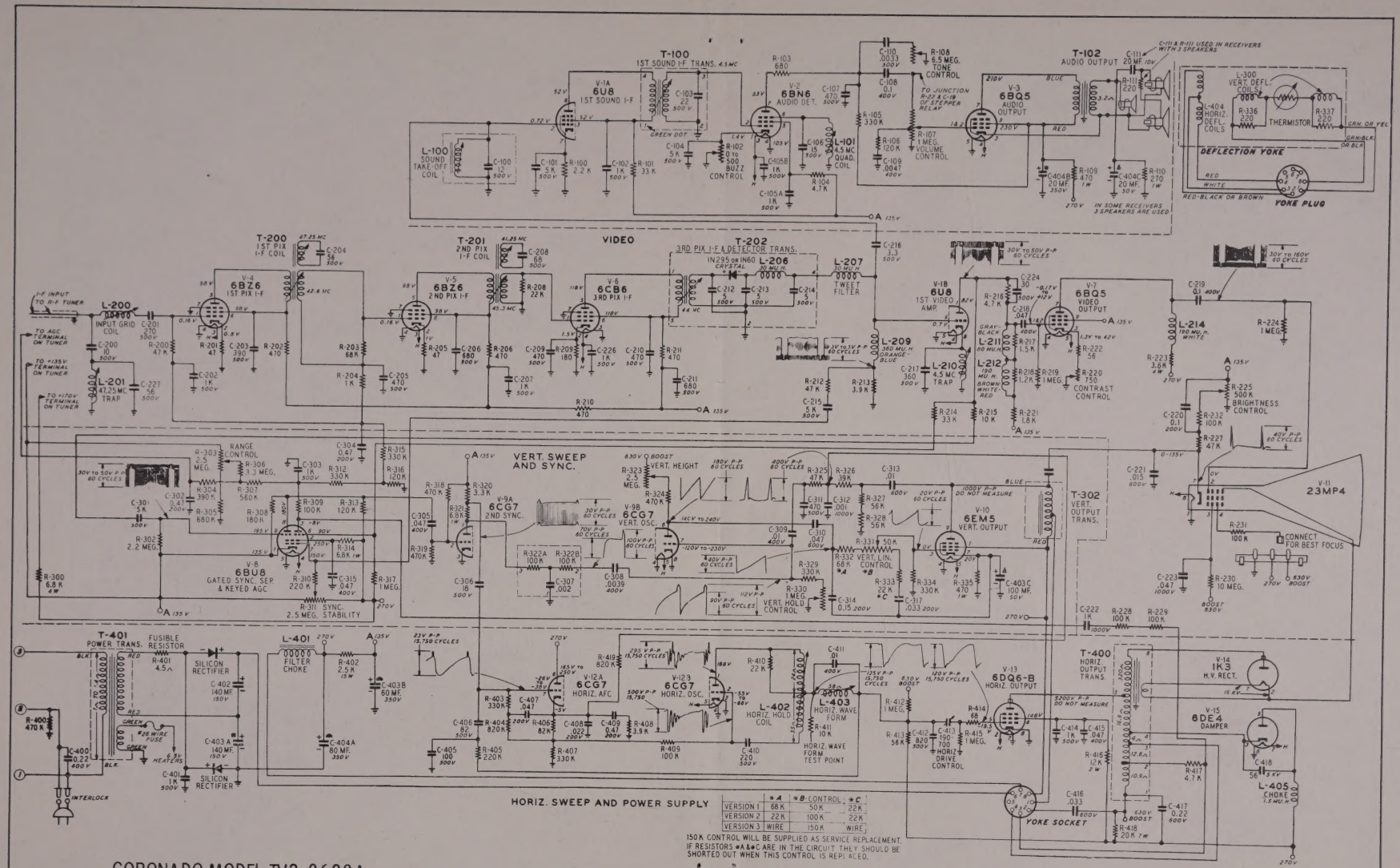
PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	MAGNAVOX PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			420-TS-TB	N8-1 * & N8-3 *	46T	Not Req.			

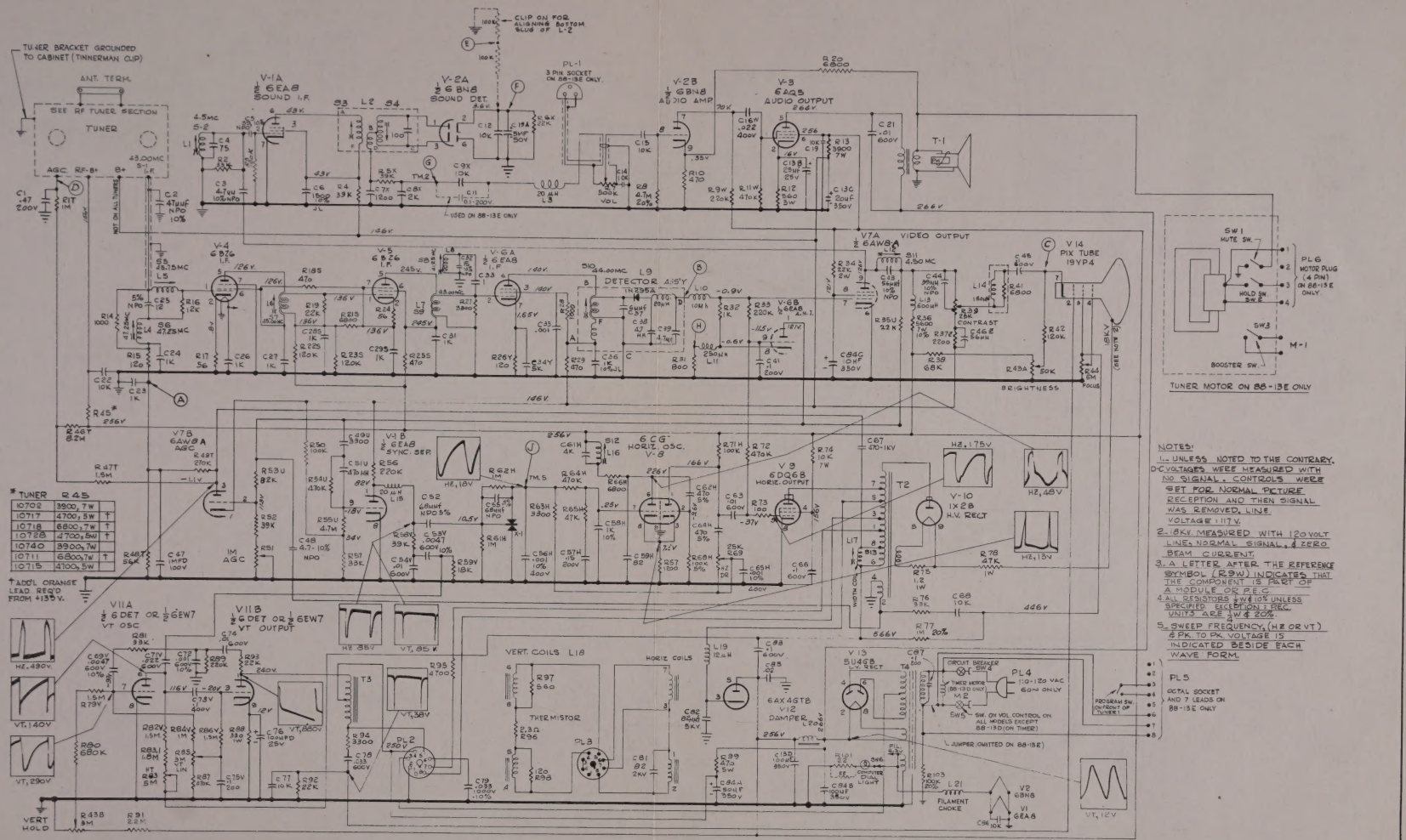
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



CORONADO MODEL TV2-9620A

Schematic Diagram Courtesy of Gamble Skogmo, Inc.


TUNER
ANT. TERM.
V-1A 6EA8 SOUND I.F.
V-2A ½ 6BN8 SOUND DET.
V-2B ½ 6BN8 AUDIO AMP
V-3 6AQ5 AUDIO OUTPUT
V-4 6BZ6 I.F.
V-5 6BZ6 I.F.
V-6A 6EA8 I.F.
V-6B 6EA8 SYNC. SEP.
V7A VIDEO OUTPUT ½ 6AW8A
V7B 6AW8A AGC
V-8 6CG HORIZ. OSC.
V9 6DQ6B HORIZ. OUTPUT
V10 1X2B H.V. RECT
V11A ½ 6DET OR ½ 6EW7 VT OSC
V11B ½ 6DET OR ½ 6EW7 VT OUTPUT
V12 6AX4GTB DAMPER
V13 BU4GB TV RECT
V14 PIX TUBE 19VP4
DETECTOR ASSY
VERT. COILS L18
HORIZ. COILS
THERMISTOR
FILAMENT CHOKE
BRIGHTNESS
CONTRAST
FOCUS
HOLD SW.
BOOSTER SW.
MUTE SW.
M-1
PL1 3 PIN SOCKET ON 88-13E ONLY
PL4 TIMER MOTOR (88-13D ONLY)
PL5 OCTAL SOCKET AND 7 LEADS ON 88-13E ONLY
PL6 MOTOR PLUG (4 PIN) ON 88-13E ONLY
TUNER MOTOR ON 88-13E ONLY
CIRCUIT BREAKER SW 4
SW5 SW. ON VOL CONTROL ON ALL MODELS EXCEPT 88-13D (ON TIMER)
PROGRAM SW. ON FRONT OF TUNER
JUMPER (OMITTED ON 88-13E)
VERT HOLD
HZ. 480V
VT. 140V
VT. 290V
HZ. 35V
VT. 85V
VT. 38V
VT. 220V
HZ. 18V
HZ. 175V
HZ. 48V
VT. 12V
146V
266V
566V
446V
NOTES:
1. UNLESS NOTED TO THE CONTRARY, D-C VOLTAGES WERE MEASURED WITH NO SIGNAL. CONTROLS WERE SET FOR NORMAL PICTURE RECEPTION AND THEN SIGNAL WAS REMOVED. LINE VOLTAGE 117V.
2. 18KV MEASURED WITH 120 VOLT LINE, NORMAL SIGNAL, & ZERO BEAM CURRENT.
3. A LETTER AFTER THE REFERENCE SYMBOL (R9W) INDICATES THAT THE COMPONENT IS PART OF A MODULE OR P.E.C.
4. ALL RESISTORS ½W & 10% UNLESS SPECIFIED EXCEPTION: PEC UNITS ARE 1W & 20%
5. SWEEP FREQUENCY (HZ OR VT) & PK. TO PK. VOLTAGE IS INDICATED BESIDE EACH WAVE FORM.
* TUNER R45
10702 3900, 7W
10717 4700, 5W
10718 6800, 7W
10728 4700, 5W
10740 3900, 7W
10711 6800, 7W
10715 4700, 5W
† ADD 1 ORANGE LEAD REQ'D FROM +135V.

PACKARD BELL MODELS 19C2, 19C3, 19T6, 19T7, 19T8, 19T9 (CH. 88-13C, D, E, F)

Schematic Diagram Courtesy of Packard Bell Electronics Corp.

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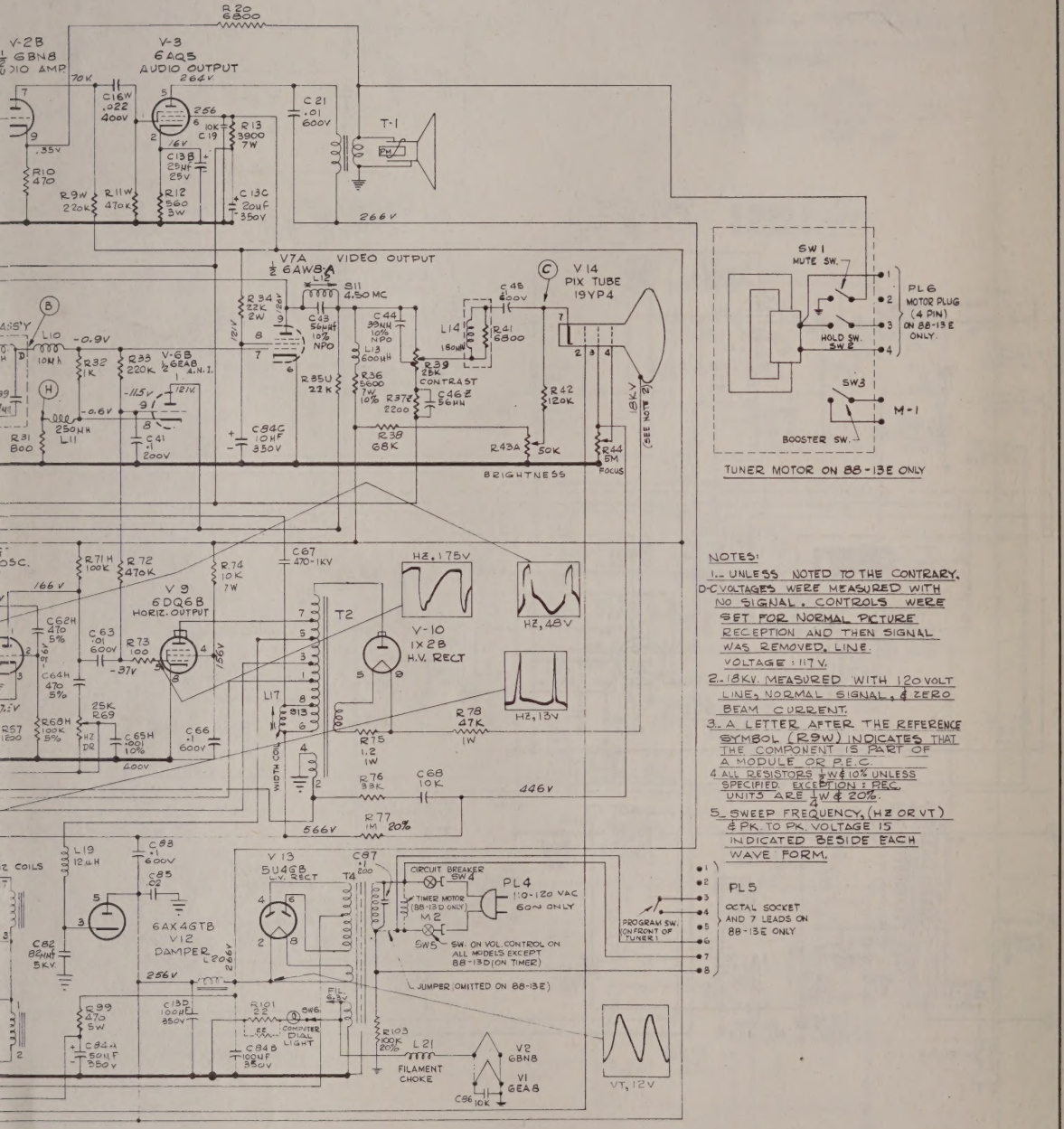

NOTES:

1. UNLESS NOTED TO THE CONTRARY, D-C VOLTAGES WERE MEASURED WITH NO SIGNAL. CONTROLS WERE SET FOR NORMAL PICTURE RECEPTION AND THEN SIGNAL WAS REMOVED. LINE VOLTAGE: 117 V.
2. 18KV. MEASURED WITH 120 VOLT LINE, NORMAL SIGNAL, & ZERO BEAM CURRENT.
3. A LETTER AFTER THE REFERENCE SYMBOL (R9W) INDICATES THAT THE COMPONENT IS PART OF A MODULE OR P.E.C.
4. ALL RESISTORS $\frac{1}{2}$W & 10% UNLESS SPECIFIED. EXCEPTION: PEC UNITS ARE $\frac{1}{4}$W & 20%.
5. SWEEP FREQUENCY, (HZ OR VT) & PK. TO PK. VOLTAGE IS INDICATED BESIDE EACH WAVE FORM.

C, D, E, F)

Schematic Diagram Courtesy of Packard Bell Electronics Corp.